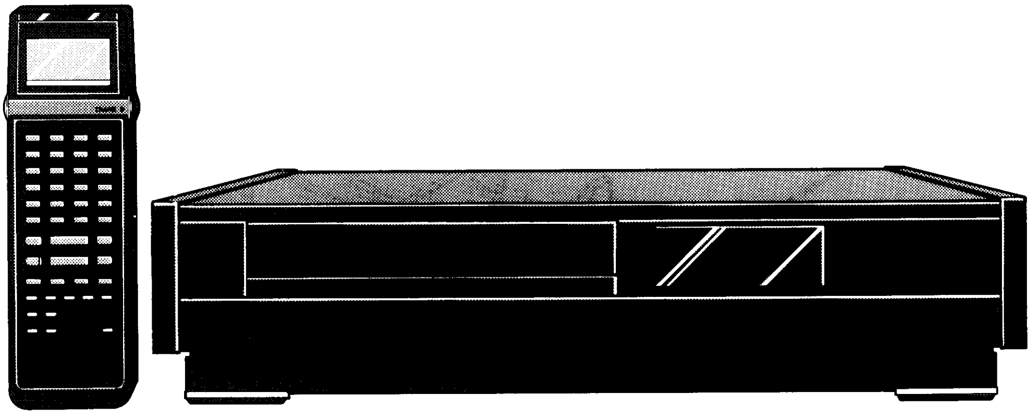
SANYO

Service Manual

Colour Video Cassette Recorder

VHR-D4890 Series



VHR-4890ES

S-VHS 625 VHS PAL

Hi-Fi HQ

DIGITAL

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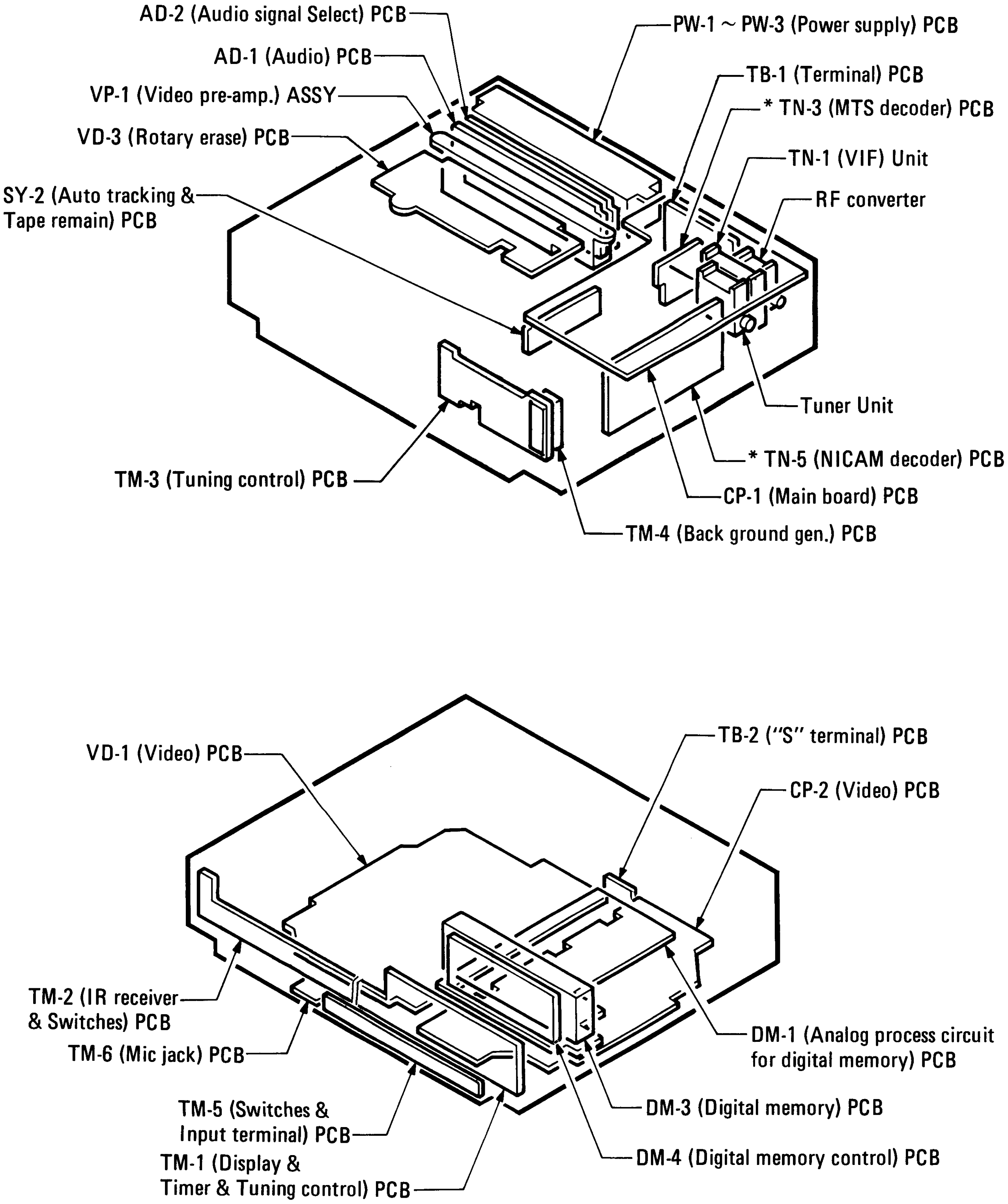
DP4PHSL Series

MC-Service

REFERENCE No. WM-530228

1. CIRCUIT BOARD LOCATIONS
1-1. MAIN BOARDS


AD-2 (Audio signal Select) PCB
PW-1 ~ PW-3 (Power supply) PCB
AD-1 (Audio) PCB
TB-1 (Terminal) PCB
VP-1 (Video pre-amp.) ASSY
* TN-3 (MTS decoder) PCB
VD-3 (Rotary erase) PCB
TN-1 (VIF) Unit
RF converter
SY-2 (Auto tracking & Tape remain) PCB
Tuner Unit
* TN-5 (NICAM decoder) PCB
TM-3 (Tuning control) PCB
CP-1 (Main board) PCB
TM-4 (Back ground gen.) PCB
VD-1 (Video) PCB
TB-2 ("S" terminal) PCB
CP-2 (Video) PCB
TM-2 (IR receiver & Switches) PCB
TM-6 (Mic jack) PCB
DM-1 (Analog process circuit for digital memory) PCB
DM-3 (Digital memory) PCB
TM-5 (Switches & Input terminal) PCB
DM-4 (Digital memory control) PCB
TM-1 (Display & Timer & Tuning control) PCB

* TN-3 (MTS decoder) PCB is incorporated in models VHR-D4890G, I and VHR-D4890 (Australia).

* TN-5 (NICAM decoder) PCB is incorporated in models VHR-D4890E, ES, ES (Spain), and it is also available as option for model VHR-D4890 (New Zealand).

Fig. 1-1

1-2. TEST POINT FOR TAPE PATH ADJUSTMENT

- The terminal (CN183) for tape path adjustment is shown in figure below.
  For adjustment, refer to the separate volume "Mechanism Service Technical Information".

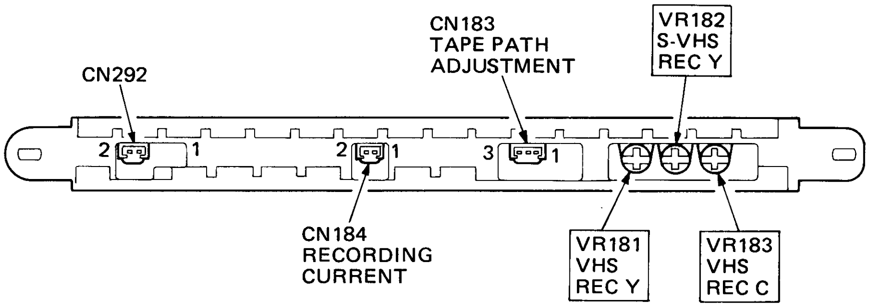


Fig. 1-2 VP-1 ASSY

2. ELECTRICAL ADJUSTMENT

2-1. PREPARATION

2-1-1. EQUIPMENT

- Colour TV monitor
- PAL Colour-bar generator (with RF and LINE OUTPUT)
- Audio frequency oscillator
- Oscilloscope (dual trace; frequency response: 10MHz or more; probe: 10:1)
- Frequency counter (countable to 10MHz or higher)
- Digital voltmeter
- AC voltmeter
- In/output probes
- Alignment cassette (VHJ-0008) Colour bar 1KHz
- Alignment cassette (VHJ-0009) Monoscope 6KHz
- Alignment cassette (VHJ-0020) Colour bar for audio FM
- Alignment cassette (VHJ-0023) PAL Monoscope 6KHz, PAL Colour bar 1KHz, SECAM Colour bar 1KHz, PAL RF Sweep MESECAM Colour bar 1KHz, NTSC Colour-bar 1KHz.
- Alignment cassette (VHJ-0068) PAL S-VHS Colour bar 1KHz.

2-1-2. SET-UP

Because the RF input signal is used for circuit adjustments, connect the colour-bar generator to the ANT IN terminal of the VCR. The RF input signal is processed by the tuner and IF circuit. It is important that the video output signal of the IF circuit satisfies the items shown in Fig. 2-1. Connect the oscilloscope to the VIDEO OUTPUT terminal of the video circuit, and then check the video output signal.

- The amplitude of the sync signal should be approximately 0.3 Vp-p.
- The amplitude of the video signal should be approximately 0.7 Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the colour burst amplitude is approximately 0.3 Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.

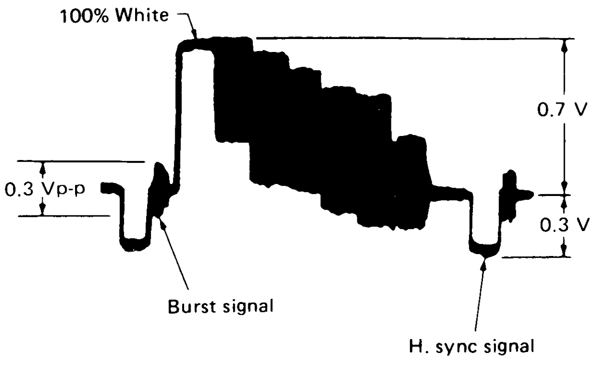


Fig. 2-1

2-2. SERVO CIRCUIT ADJUSTMENT..... CP-1 PCB

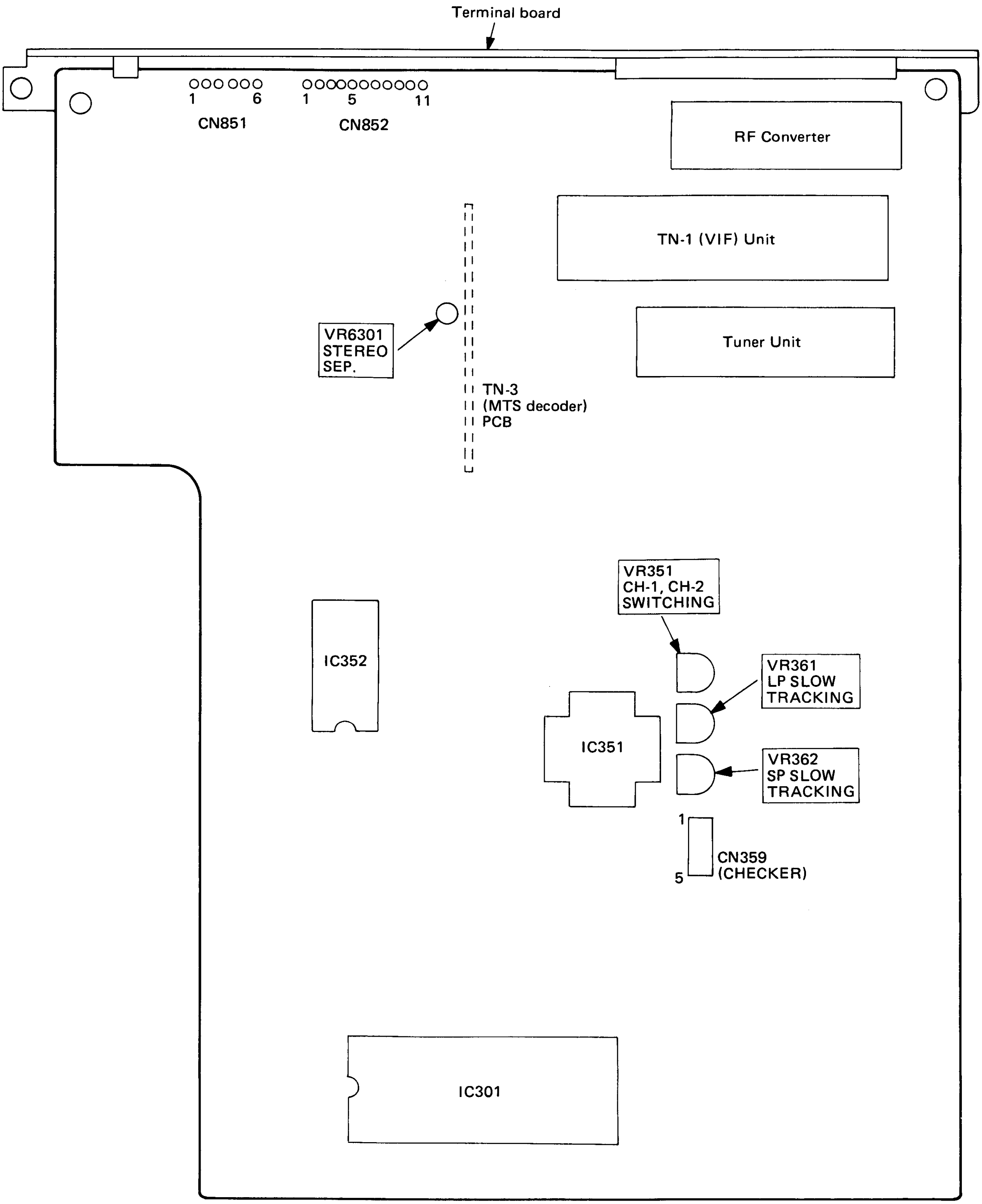
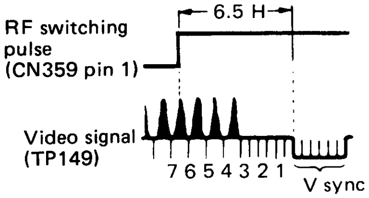
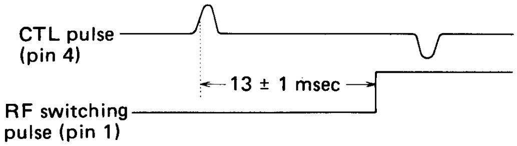
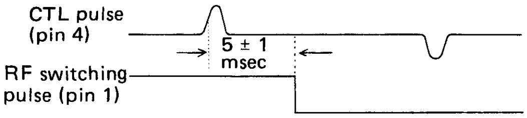

Terminal board
1
6
CN851
1
5
11
CN852
RF Converter
TN-1 (VIF) Unit
Tuner Unit
VR6301
STEREO
SEP.
TN-3
(MTS decoder)
PCB
VR351
CH-1, CH-2
SWITCHING
VR361
LP SLOW
TRACKING
VR362
SP SLOW
TRACKING
IC352
IC351
1
5
CN359
(CHECKER)
IC301

Fig. 2-2-1 CP-1 PCB (Foil side view)

NOTE (1): These adjustments should be carried out upon completion of the tape transport adjustments.

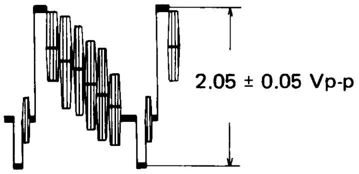
(2): If the tape transport adjustments are carried out after these adjustments, follow the procedures again in CH-1, CH-2 SWITCHING POSITIONS.

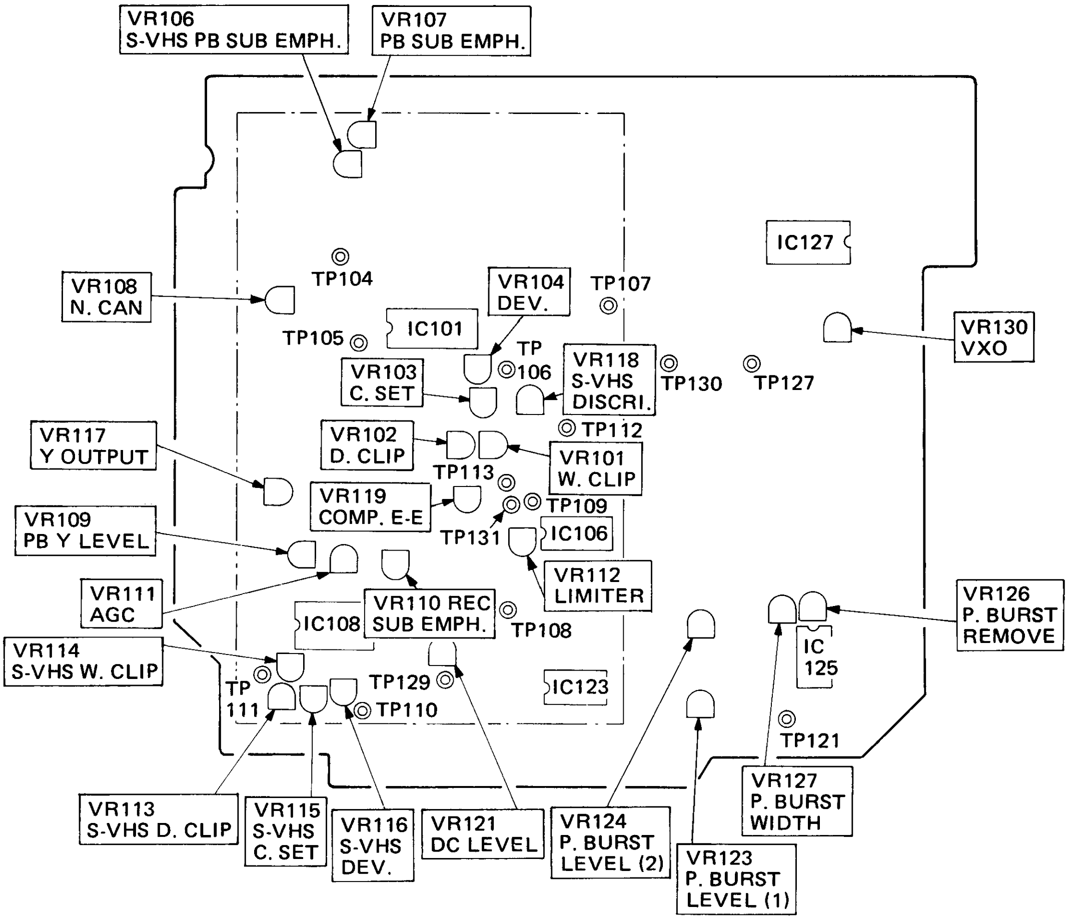
No.	Item	Input	Mode	Point	Location	Remark
1	CH-1, CH-2 SWITCHING POSITION	Alignment cassette (VHF-0009 or VHF-0023)	PLAY	VIDEO OUTPUT TP149 CN359 Pin 1 (CP-2 PCB)	VR351	 6.5 H RF switching pulse (CN359 pin 1) Video signal (TP149) 7 6 5 4 3 2 1 V sync 1. Set the tracking control to the center position (on the display "T – : – "). 2. Adjust VR351 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ± 0.5 H from the rise of the RF switching pulse waveform.
2	STILL V-LOCK for SP MODE	Colour bar from Colour bar generator	SP mode REC ↓ PLAY ↓ STILL	TV screen	VR852 Rear panel	1. Put the VCR in the REC (SP) mode and record at the middle of the cassette tape. 2. Playback the recorded part, and put the VCR in the STILL (SP) mode. 3. Adjust VR852 so that the V jitter (very fine movement of the vertical sync) is minimized.
3	SLOW TRACKING for SP MODE	Colour bar from Colour bar generator	SP mode REC ↓ PLAY ↓ SLOW	CN 359 pin 4 CN359 pin 1	VR362	 CTL pulse (pin 4) 13 ± 1 msec RF switching pulse (pin 1) 1. Playback the recorded part, and VCR in the SLOW (SP) mode by remote control unit. 2. Set the tracking control to the center position (on the display "T – : – "). 3. Adjust VR362 so that there is a trigger at approx. 1/2 of the peak level of the positive pulse leading edge of the CTL pulse and the time from this point to the leading edge of the RF switching pulse is 13 ± 1 msec. 4. Confirm that the noise at the "+" and "–" terminals for tracking adjustment is same at the upper and lower edges of the screen. If not, readjust VR362.

No.	Item	Input	Mode	Point	Location	Remark
4	STILL V-LOCK for LP MODE	Colour bar from Colour bar generator	LP mode REC ↓ PLAY ↓ STILL	TV screen	VR851 Rear panel	1. Put the VCR in the REC (LP) mode and record at the middle of the cassette tape. 2. Playback the recorded part, and put the VCR in the STILL (LP) mode. 3. Adjust VR851 so that the V jitter (very fine movement of the vertical sync) is minimized.
5	SLOW TRACKING for LP MODE	Colour bar from Colour bar generator	LP mode REC ↓ PLAY ↓ SLOW	CN 359 pin 4 CN 359 pin 1	VR361	 CTL pulse (pin 4) 5 ± 1 msec RF switching pulse (pin 1) 1. Playback the recorded part, and VCR in the SLOW (LP) mode by remote control unit. 2. Set the tracking control to the center position (on the display "T — : — "). 3. Adjust VR361 so that there is a trigger at approx. 1/2 of the peak level of the positive pulse leading edge of the CTL pulse and the time from this point to the leading edge of the RF switching pulse is 5 ± 1 msec. 4. Confirm that the noise at the "+" and "—" terminals for tracking adjustment is same at the upper and lower edges of the screen. If not, readjust VR361.

2-3. VIDEO CIRCUIT ADJUSTMENT..... VD-1 PCB, CP-2 PCB and VP-1 ASSY

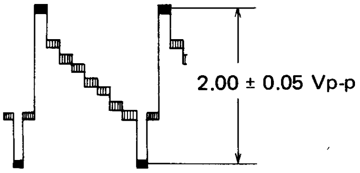
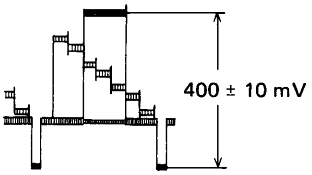
NOTE : 'No-signal REC mode' is not to supply any signal to VIDEO INPUT terminal.

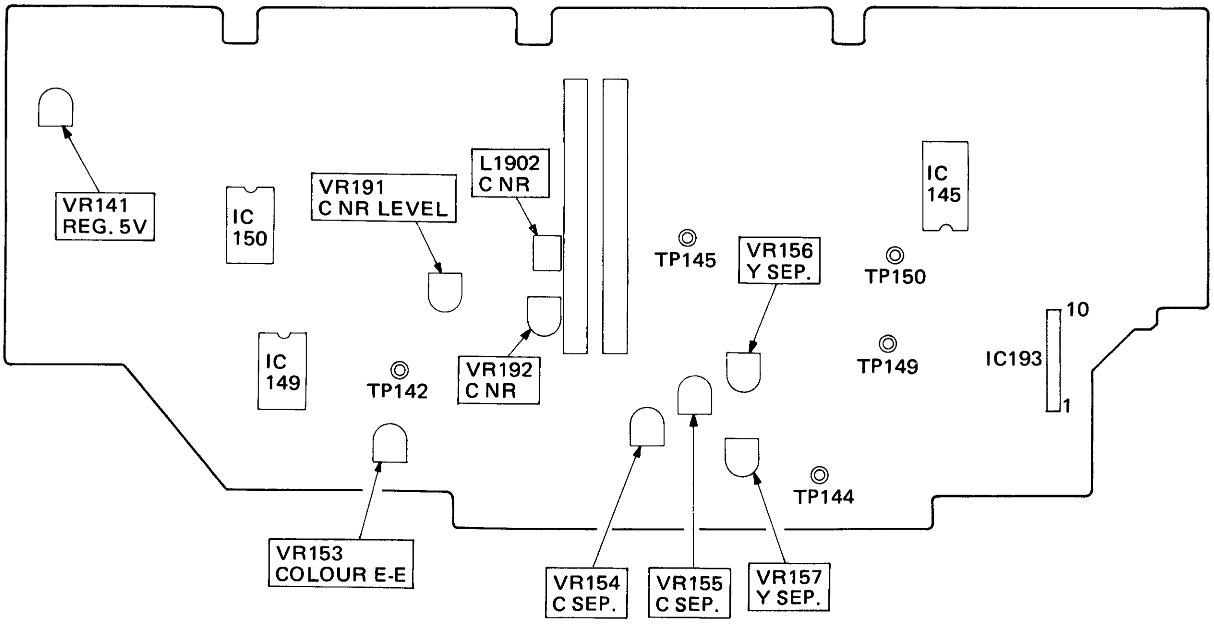
No.	Item	Input	Mode	Point	Location	Remark
1	SUPPLY VOLTAGE	No-signal	E-E	TP131 (VD-1 PCB)	VR141 (CP-2 PCB)	1. Connect the DC Voltmeter between TP131 and ground. 2. Adjust VR141 so that the voltage is 5.00 ± 0.02V.
2	AGC	Colour bar (100% White level) from Colour bar generator	E-E	VIDEO OUTPUT TP149 (CP-2 PCB)	VR111 (VD-1 PCB)	 1. Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. 2. Connect the colour bar generator (100% white level) to the "S" terminal (front panel). 3. Set the AV Input select switch to the AUX position. 4. Adjust VR111 so that the signal level is 2.05 ± 0.05 Vp-p.



VR106 S-VHS PB SUB EMPH.
VR107 PB SUB EMPH.
IC127
TP104
VR108 N. CAN
VR104 DEV.
TP107
TP105
IC101
VR130 VXO
TP106
VR103 C. SET
VR118 S-VHS DISCRI.
TP130
TP127
TP112
VR102 D. CLIP
VR101 W. CLIP
VR117 Y OUTPUT
TP113
VR119 COMP. E-E
TP109
VR109 PB Y LEVEL
TP131
IC106
VR112 LIMITER
VR111 AGC
VR110 REC SUB EMPH.
IC108
TP108
VR126 P. BURST REMOVE
VR114 S-VHS W. CLIP
IC 125
TP129
TP 111
TP110
IC123
TP121
VR127 P. BURST WIDTH
VR113 S-VHS D. CLIP
VR115 S-VHS C. SET
VR116 S-VHS DEV.
VR121 DC LEVEL
VR124 P. BURST LEVEL (2)
VR123 P. BURST LEVEL (1)

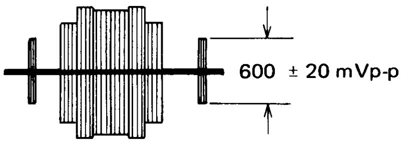
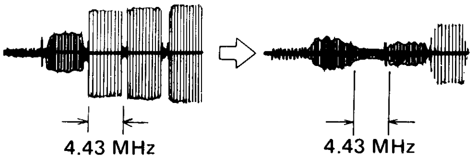
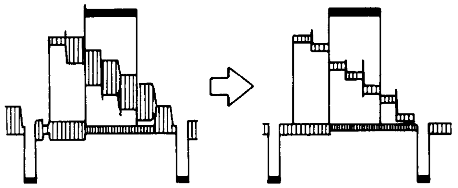
Fig. 2-3-1 VD-1 PCB (Foil side view)

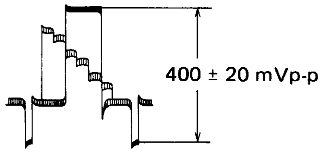
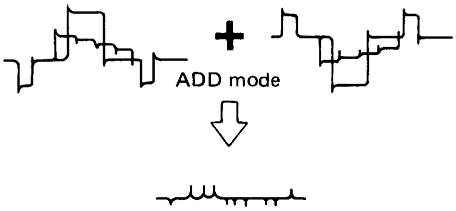
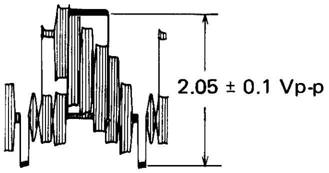
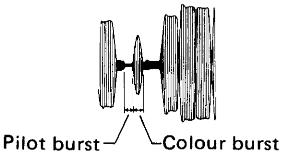
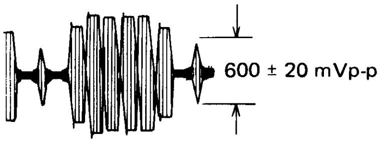
No.	Item	Input	Mode	Point	Location	Remark
3	COMPO-SITE E-E LEVEL	Colour bar (100% white level) from Colour bar generator	PinP	TP113 (VD-1 PCB)	VR119 (VD-1 PCB)	 1. Connect the colour bar generator (100% white level) to the "S" terminal (front panel). 2. Set the AV Input select switch to the AUX position. 3. Adjust VR119 so that the signal level is 2.00 ± 0.05 Vp-p.
4	REC SUB EMPHASIS LEVEL	Colour bar (100% white level) from Colour bar generator	E-E	TP108 (VD-1 PCB)	VR110 (VD-1 PCB)	 1. Connect the colour bar generator (100% white level) to the EURO-AV terminal (rear panel). 2. Set the AV Input select switch to the EURO-AV position. 3. Adjust VR110 so that the signal level is 400 ± 10 mV.
5	SUB EMPHASIS LIMITER LEVEL	No-signal	E-E	TP109 (VD-1 PCB)	VR112 (VD-1 PCB)	1. Connect the DC Voltmeter between TP109 and ground. 2. Adjust VR112 so that the voltage is 3.48 ± 0.02 V.



VR141
REG. 5V
IC 150
VR191
C NR LEVEL
L1902
C NR
IC 145
TP145
VR156
Y SEP.
TP150
10
IC193
1
IC 149
TP142
VR192
C NR
TP149
TP144
VR153
COLOUR E-E
VR154
C SEP.
VR155
C SEP.
VR157
Y SEP.

Fig. 2-3-2 CP-2 PCB (Foil side view)

No.	Item	Input	Mode	Point	Location	Remark
6	COLOUR E-E LEVEL	Colour bar from Colour bar generator	E-E	TP150 (CP-2 PCB)	VR153 (CP-2 PCB)	 1. Connect the colour bar generator to the "S" terminal (front panel). 2. Set the AV Input select switch to the AUX position. 3. Adjust VR153 so that the colour burst level is 600 ± 20 mV.
7	CHROMI-NANCE SEPARA-TION	Multi-burst from Colour bar generator	E-E	TP145 (CP-2 PCB)	VR154 VR155 (CP-2 PCB)	 1. Set the AV input select switch to the EURO-AV position. 2. Set the COMB FILTER switch (rear panel) to the ON position. 3. Adjust VR154 and VR155 alternately for minimum level of the luminance signal component within the colour frequency band (4.43 MHz).
8	LUMI-NANCE SEPARA-TION	Colour bar from Colour bar generator	E-E	TP144 (CP-2 PCB)	VR156 VR157 (CP-2 PCB)	 1. Connect the colour bar generator to the EURO-AV terminal (rear panel). 2. Set the AV Input select switch to the EURO-AV position. 3. Set the COMB FILTER switch (rear panel) to the ON position. 4. Adjust VR156 and VR157 alternately so that the chrominance signal is minimum.
9	LUMI-NANCE OUTPUT	Colour bar from Colour bar generator	E-E	IC193 Pin 1 and Pin 3 (CP-2 PCB)	VR117 (VD-1 PCB)	1. Connect the colour bar generator to the EURO-AV terminal (rear panel). 2. Set the AV Input select switch to the EURO-AV position. 3. Adjust VR117 so that pin 1 and pin 3 are same level.

No.	Item	Input	Mode	Point	Location	Remark
10	PLAY BACK SUB EMPHASIS LEVEL	Alignment cassette (VHJ-0008)	PLAY (SP)	TP108 (VD-1 PCB)	VR107 (VD-1 PCB)	 1. Adjust VR107 so that the signal level is 400 ± 20 mVp-p.
11	NOISE CANCEL- LER LEVEL	Alignment cassette (VHJ-0008)	PLAY (SP)	TO104 TP105 (VD-1 PCB)	VR108 (VD-1 PCB)	 1. Invert the channel of oscilloscope connected to TP105 and set to the ADD mode. 2. Adjust VR108 until the waveform becomes a straight line. Notes: (1) Use the same type of probe for CH1 and CH2. (2) Use the same oscilloscope control setting for CH1 and CH2.
12	PLAY BACK LUMI- NANCE LEVEL	Alignment cassette (VHJ-0008)	PLAY (SP)	VIDEO OUTPUT TP149 (CP-2 PCB)	VR109 (VD-1 PCB)	 1. Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. 2. Adjust VR109 so that the signal level is 2.05 ± 0.1 Vp-p.
13	VXO	Alignment cassette (VHJ-0008)	PLAY (SP)	TP127 (VD-1 PCB)	VR130 (VD-1 PCB)	1. Adjust VR130 so that the frequency is 4.433619 MHz ± 20 Hz.
14	PILOT BURST LEVEL	Alignment cassette (VHJ-0008)	PLAY (SP)	TP129 (VD-1 PCB)	VR121 (VD-1 PCB)	 1. Adjust VR121 so that the pilot burst signal is minimum.
15	CHROMA NOISE REDUC- TION LEVEL	Alignment cassette (VHJ-0008)	PLAY (SP)	TP150 (CP-2 PCB)	VR191 (CP-2 PCB)	 1. Adjust VR191 so that the colour burst level is 600 ± 20 mV.

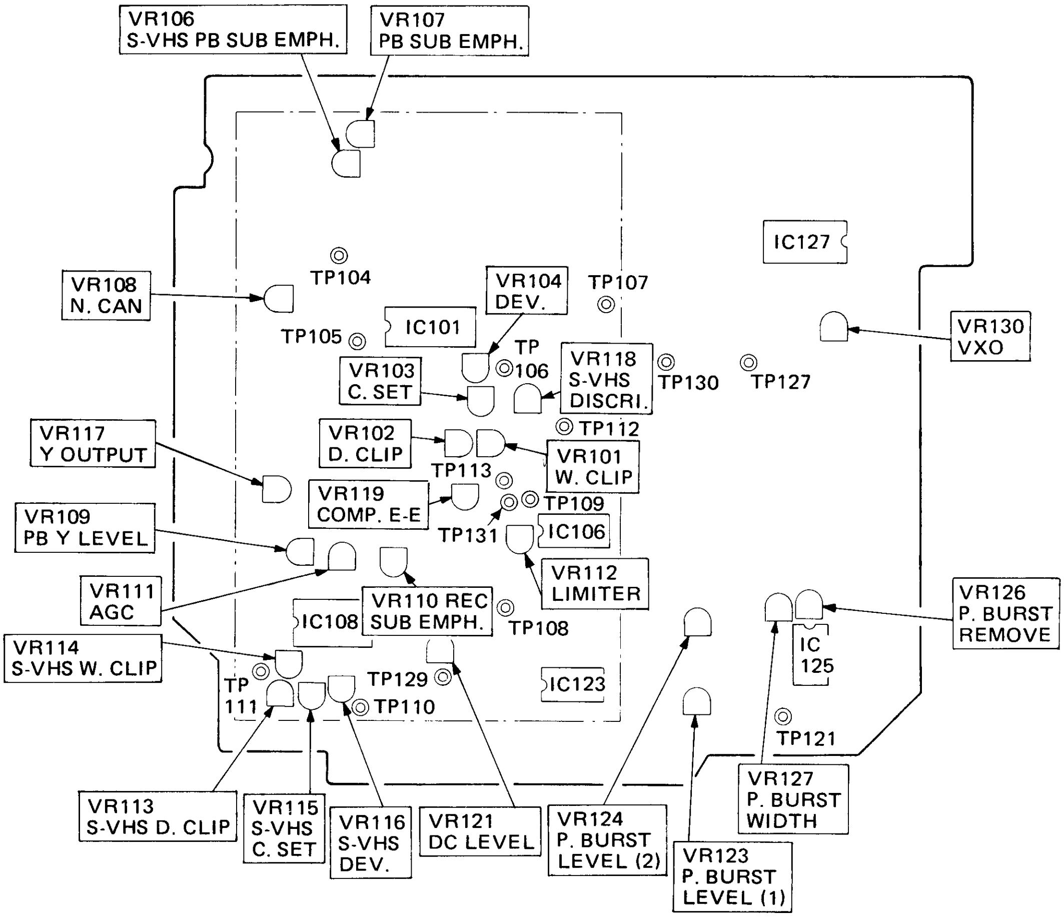
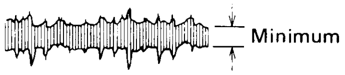
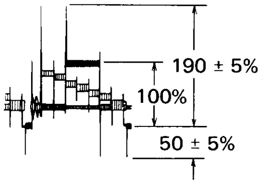
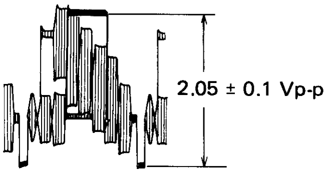

VR106
S-VHS PB SUB EMPH.
VR107
PB SUB EMPH.
IC127
TP104
VR108
N. CAN
VR104
DEV.
TP107
TP105
IC101
TP
106
VR118
S-VHS
DISCRI.
TP130
TP127
VR130
VXO
VR103
C. SET
VR117
Y OUTPUT
VR102
D. CLIP
TP112
VR101
W. CLIP
TP113
VR119
COMP. E-E
TP109
TP131
IC106
VR109
PB Y LEVEL
VR112
LIMITER
VR111
AGC
VR110 REC
SUB EMPH.
IC108
TP108
VR126
P. BURST
REMOVE
IC
125
VR114
S-VHS W. CLIP
TP
111
TP129
TP110
IC123
TP121
VR127
P. BURST
WIDTH
VR113
S-VHS D. CLIP
VR115
S-VHS
C. SET
VR116
S-VHS
DEV.
VR121
DC LEVEL
VR124
P. BURST
LEVEL (2)
VR123
P. BURST
LEVEL (1)

Fig. 2-3-3 VD-1 PCB (Foil side view)

No.	Item	Input	Mode	Point	Location	Remark
16	CHROMA NOISE REDUCTION	Alignment cassette (VHJ-0008)	PLAY (SP)	TP142 (CP-2 PCB)	VR192 L1902 (CP-2 PCB)	 1. Adjust VR192 and L1902 alternately so that the chrominance signal is minimum.
17	WHITE CLIP & DARK CLIP	Colour bar (100% white level) from Colour bar generator	E-E	TP106 (VD-1 PCB)	VR101 VR102 (VD-1 PCB)	 190 ± 5% 100% 50 ± 5% 1. Connect the colour bar generator (100% white level to the EURO-AV terminal. 2. Set the S-VHS switch to the OFF position. 3. Set the AV Input select switch to the EURO-AV position. 4. Adjust VR101 so that the luminance signal level is 190 ± 5%. 5. Adjust VR102 so that the luminance signal level is 50 ± 5%.

No.	Item	Input	Mode	Point	Location	Remark
18	CARRIER SET	No-signal	E-E	TP107 (VD-1 PCB)	VR103 (VD-1 PCB)	1. Connect the frequency counter between TP107 and ground. 2. Set the S-VHS switch to the OFF position. 3. Adjust VR103 so that the frequency is 3.83 ± 0.03 MHz.
19	DEVIA-TION	Colour bar (100% white level) from Colour bar generator	REC (SP) ↓ PLAY (SP)	VIDEO OUTPUT TP149 (CP-2 PCB)	VR104 (VD-1 PCB)	 1. Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. 2. Set the S-VHS switch to the OFF position. 3. Playback the just-recorded portion in SP mode. 4. Adjust VR104 so that the signal level is 2.05 ± 0.1 Vp-p. 5. Confirm that the frequency at TP107 (CARRIER SET) is 3.83 ± 0.03 MHz. 6. Repeat steps 18 and 19 if necessary.

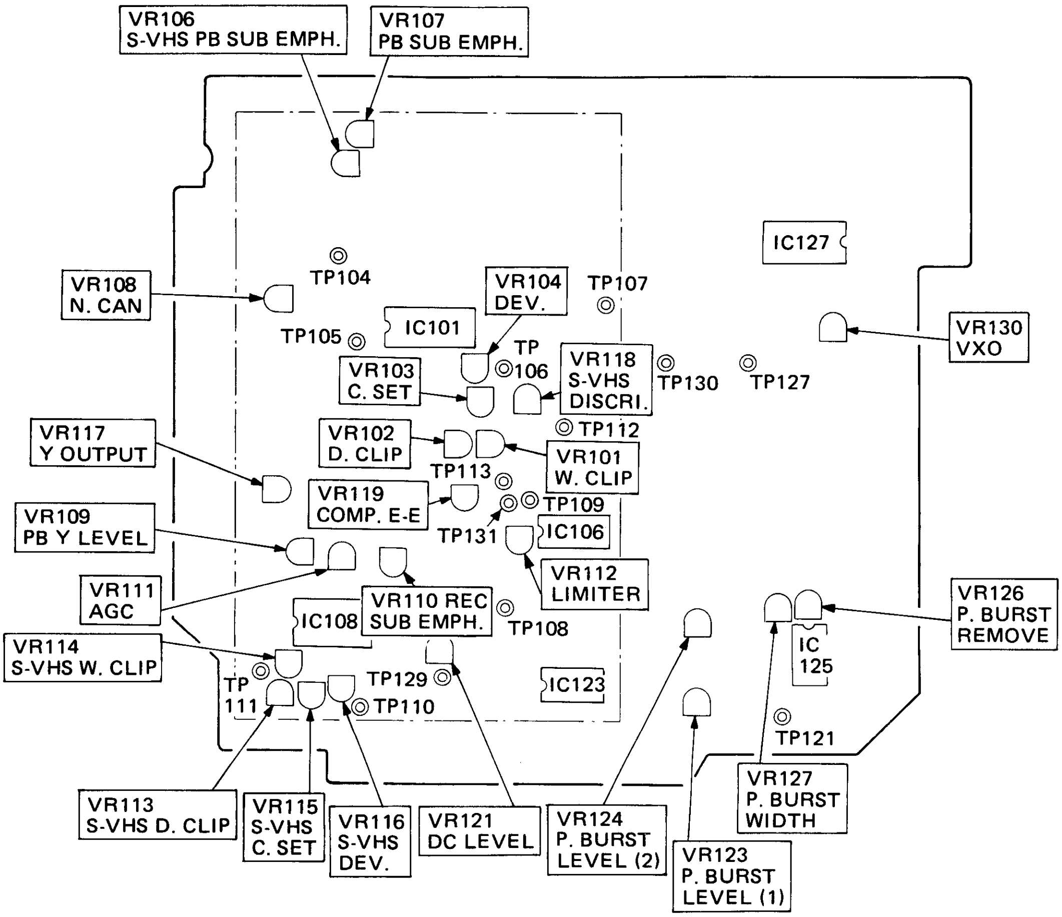
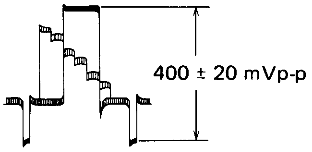
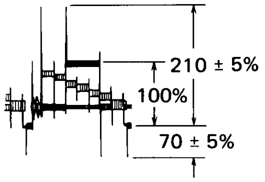
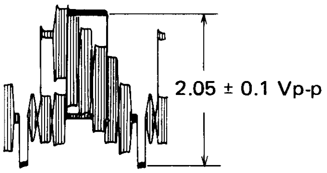
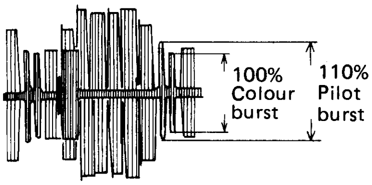
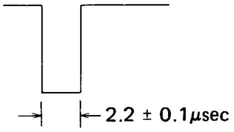
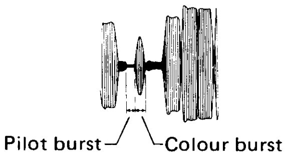
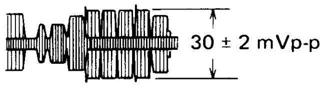
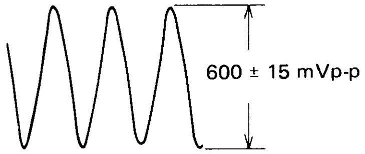
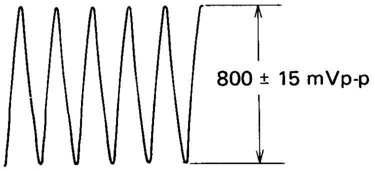

VR106 S-VHS PB SUB EMPH.
VR107 PB SUB EMPH.
IC127
TP104
VR108 N. CAN
VR104 DEV.
TP107
TP105
IC101
VR130 VXO
TP106
VR103 C. SET
VR118 S-VHS DISCRI.
TP130
TP127
TP112
VR117 Y OUTPUT
VR102 D. CLIP
VR101 W. CLIP
TP113
VR119 COMP. E-E
TP109
VR109 PB Y LEVEL
TP131
IC106
VR112 LIMITER
VR111 AGC
VR110 REC SUB EMPH.
IC108
TP108
VR126 P. BURST REMOVE
IC 125
VR114 S-VHS W. CLIP
TP 111
TP129
TP110
IC123
TP121
VR127 P. BURST WIDTH
VR113 S-VHS D. CLIP
VR115 S-VHS C. SET
VR116 S-VHS DEV.
VR121 DC LEVEL
VR124 P. BURST LEVEL (2)
VR123 P. BURST LEVEL (1)

Fig. 2-3-4 VD-1 PCB (Foil side view)

No.	Item	Input	Mode	Point	Location	Remark
20	S-VHS DISCRIMI-NATION	Colour bar from Colour bar generator	REC (SP) ↓ PLAY (SP)	TP112 (VD-1 PCB)	VR118 (VD-1 PCB)	1. Set the S-VHS switch to the OFF position. 2. Insert the S-VHS Blank tape to the VCR and record colour bar signal. 3. Playback the just-recorded portion in SP mode. 4. Adjust VR118 so that the level is 2.0 ± 0.1 V (DC).
21	S-VHS PLAY-BACK SUB EMPHASIS LEVEL	Alignment cassette (VHJ-0068)	PLAY (SP)	TP108 (VD-1 PCB) TP149 (CP-2 PCB)	VR106 (VD-1 PCB)	 1. Set the S-VHS switch to the AUTO position. 2. Adjust VR106 so that the signal level at TP108 is 400 ± 20 mVp-p. 3. Confirm that the signal level of TP149 is 2.05 ± 0.1 Vp-p. 4. Repeat steps 20 and 21 if necessary.
22	S-VHS WHITE CLIP & DARK CLIP	Colour bar (100% white level) from Colour bar generator	E-E	TP110 (VD-1 PCB)	VR114 VR113 (VD-1 PCB)	 1. Connect the colour bar generator (100% white level) to the EURO-AV terminal. 2. Set the S-VHS switch to the AUTO position. 3. Set the AV Input select switch to the EURO-AV position. 4. Adjust VR114 so that the luminance signal level is 210 ± 5%. 5. Adjust VR113 so that the luminance signal level is 70 ± 5%.
23	S-VHS CARRIER SET	No-signal	E-E	TP111 (VD-1 PCB)	VR115 (VD-1 PCB)	1. Connect the frequency counter between TP111 and ground. 2. Set the S-VHS switch to the AUTO position. 3. Adjust VR115 so that the frequency is 5.40 ± 0.02 MHz.

No.	Item	Input	Mode	Point	Location	Remark
24	S-VHS DEVIATION	Colour bar (100% white level) from Colour bar generator	REC (SP) ↓ PLAY (SP)	VIDEO OUTPUT TP149 (CP-2 PCB)	VR116 (VD-1 PCB)	 1. Terminate the VIDEO OUTPUT terminal with a 75 Ω resistor. 2. Set the S-VHS switch to the AUTO position. 3. Playback the just-recorded portion in SP mode. 4. Adjust VR116 so that the signal level is 2.05 ± 0.1 Vp-p. 5. Confirm that the frequency at TP111 (CARRIER SET) is 5.40 ± 0.02 MHz. 6. Repeat steps 23 and 24 if necessary.
25	PILOT BURST LEVEL (1)	Colour bar from Colour bar generator	E-E	TP130 (VD-1 PCB)	VR123 (VD-1 PCB)	 1. Connect the colour bar generator to the EURO-AV terminal (rear panel). 2. Set the AV Input select switch to the EURO-AV position. 3. Set the S-VHS switch to the AUTO position. 4. Adjust VR123 so that the pilot burst level is 110 ± 5% for the colour barst level.
26	PILOT BURST LEVEL (2)	Colour bar from Colour bar generator	E-E	TP130 (VD-1 PCB)	VR124 (VD-1 PCB)	1. Connect the colour bar generator to the "S" input terminal (front panel). 2. Set the AV Input select switch to the AUX position. 3. Set the S-VHS switch to the AUTO position. 4. Adjust VR124 so that the pilot burst level is 110 ± 5% for the colour barst level.

No.	Item	Input	Mode	Point	Location	Remark
27	PILOT BURST WIDTH	Colour bar from Colour bar generator	E-E	TP121 (VD-1 PCB)	VR127 (VD-1 PCB)	 1. Connect the colour bar generator to the EURO-AV terminal (rear panel). 2. Set the AV Input select switch to the EURO-AV position. 3. Set the S-VHS switch to the AUTO position. 4. Adjust VR127 so that the pulse width is 2.2 ± 0.1 μsec.
28	PILOT BURST REDUCE	Alignment cassette (VHJ-0068)	PLAY (SP)	TP129 (VD-1 PCB)	VR126 (VD-1 PCB)	 1. Adjust VR126 so that only the pilot burst signal disappears and neighboring colour burst signal does not reduce.
29	VHS CHROMINANCE AND LUMINANCE SIGNAL RECORDING CURRENT	Colour bar from Colour bar generator	REC (LP)	CN184 pin 2 CN182 pin 1 (GND) (VP-1 Assy)	VR181 VR183 (VP-1 Assy)	  1. Connect a lead wire between TP171 and TP172 of the VD-3 PCB. 2. Connect the colour bar generator to the EURO-AV terminal. 3. Set the S-VHS switch to the OFF position. 4. Insert the S-VHS Blank tape to the VCR and REC (LP) mode. 5. Rotate VR181 counter-clockwise fully to the minimum level. 6. Adjust VR183 so that the chrominance signal level is 30 ± 2 mVp-p. 7. Remove a lead wire and the colour bar generator respectively. 8. Set the VCR in the no-signal REC (LP) mode. 9. Adjust VR181 so that the luminance signal level is 600 ± 15 mVp-p.

No.	Item	Input	Mode	Point	Location	Remark
30	S-VHS LUMINANCE SIGNAL RECORDING CURRENT	No-signal	REC (LP)	CN184 pin 2 CN182 pin 1 (GND) (VP-1 Assy)	VR182 (VP-1 Assy)	 1. Set the S-VHS switch to the AUTO position. 2. Insert the S-VHS Blank tape to the VCR and no-signal REC (LP) mode. 3. Adjust VR182 so that the luminance signal level is 800 ± 15 mVp-p.

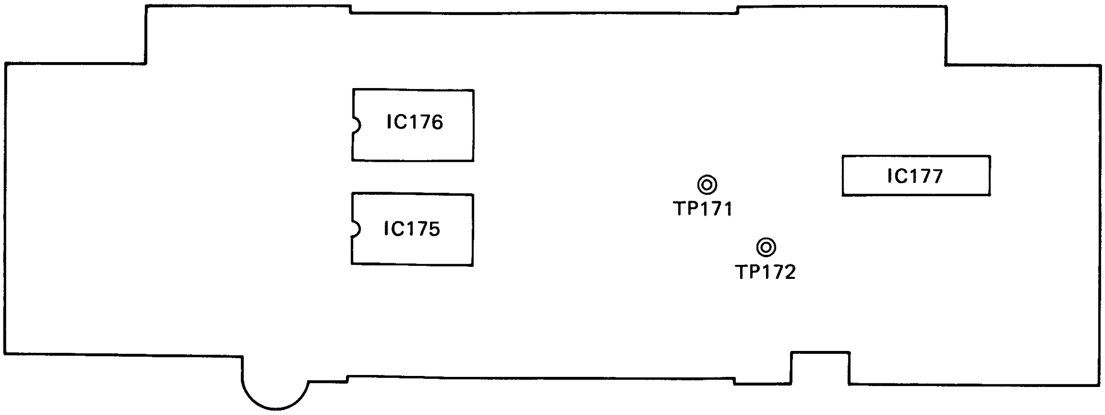

IC176
IC175
TP171
TP172
IC177

Fig. 2-3-5 VD-3 PCB (Foil side view)

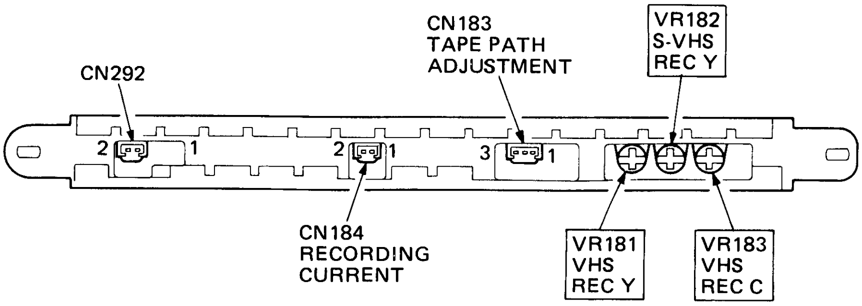
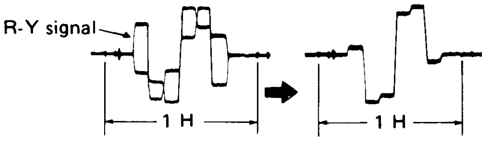
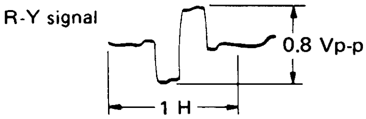
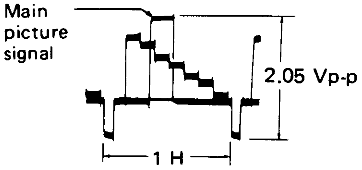

CN292
2
1
CN183
TAPE PATH
ADJUSTMENT
VR182
S-VHS
REC Y
2
1
3
1
CN184
RECORDING
CURRENT
VR181
VHS
REC Y
VR183
VHS
REC C

Fig. 2-3-6 VP-1 ASSY

2-4. VIDEO DIGITAL PROCESS CIRCUIT ADJUSTMENT ... DM-1 and DM-3 PCB

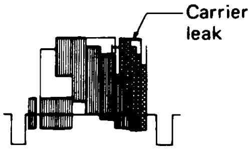
SETTING BEFORE ADJUSTMENT

(1) Receive the TV broadcast signal on the main picture . . . . . Item No. 1 – No. 3
(2) Receive the TV broadcast signal on the sub picture . . . . . Item No. 4
(3) Set the LINE-in signal to the sub picture . . . . . Item No. 2 – No. 3
(4) Set the LINE-in signal to the main picture . . . . . Item No. 4

No.	Item	Input	Mode	Point	Location	Remark
1	DECODER VXO	LINE: None	E-E (AV) PinP	TP473 (DM-1 PCB)	CT471 (DM-1 PCB)	1. Connect a lead wire between minus polarity of C4766 and ground. 2. Adjust CT471 so that the frequency is 4.433619 MHz ± 20 Hz. 3. Remove a lead wire.
2	DECODER TINT	LINE: Colour-bar from Colour-bar generator	E-E (AV) PinP	TP475 (DM-1 PCB)	VR477 (DM-1 PCB)	 1. Turn VR476 to the center position. 2. Adjust VR477 so that the waveform is merged together to becomes as one.
3	DECODER ACC	LINE: Colour-bar from Colour-bar generator	E-E (AV) PinP	TP475 (DM-1 PCB)	VR476 (DM-1 PCB)	 Adjust VR476 so that the level is 0.8 ± 0.05 Vp-p.
4	AGC LEVEL	LINE: Colour-bar (100% White level) from Colour-bar generator	E-E (TU) PinP	TP471 (DM-1 PCB)	VR472 (DM-1 PCB)	 Adjust VR472 so that the luminance level is 2.05 ± 0.1 Vp-p.

SETTING BEFORE ADJUSTMENT · · · · · Item No. 5

(1) Set the colour-bar signal from RF colour-bar generator or the colour-bar signal from alignment cassette (VHJ-0008) to the sub picture, in both cases, colour-bar signal should be inclusive 100% white peak.
(2) Set the LINE-in signal to the main picture.

No.	Item	Input	Mode	Point	Location	Remark
5	ENCODER CARRIER LEAK	LINE: Colour-bar (100% White level) from Colour-bar generator	E-E (AV) PinP	TP471 (DM-1 PCB)	VR474 VR475 (DM-1 PCB)	 1. Adjust VR474 and VR475 alternately so that the white signal carrier leakage is minimum.

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SETTING BEFORE ADJUSTMENT ····· Item No. 6 and No. 7

(1) Record the colour-bar signal on to a video tape cassette using colour-bar generator previously.

(2) Input the colour-bar signal to LINE input terminal of the VCR from the colour-bar generator.

(3) Set the VCR to PLAY mode playbacked by before mention colour-bar recorded tape cassette and set the VCR to PinP mode.

No.	Item	Input	Mode	Point	Location	Remark
6	ENCODER TINT	LINE: Colour-bar from USER'S Colour-bar generator	E-E (AV) PinP	VIDEO OUTPUT TP149 (CP-2 PCB)	VR471 (DM-1 PCB)	1. Turn VR471 to the center position. 2. Select the main picture and sub picture alternately, and check the hue of both pictures are almost the same. (VR471 is designed to be a center position when the adjustment is carried out).
7	ENCODER CHROMA LEVEL	LINE: Colour-bar from USER'S Colour-bar generator	E-E (AV) PinP	VIDEO OUTPUT TP149 (CP-2 PCB)	VR473 (DM-1 PCB)	1. Select the main picture and sub picture alternately, and adjust VR473 so that the chrominance contrast of both pictures are almost the same.

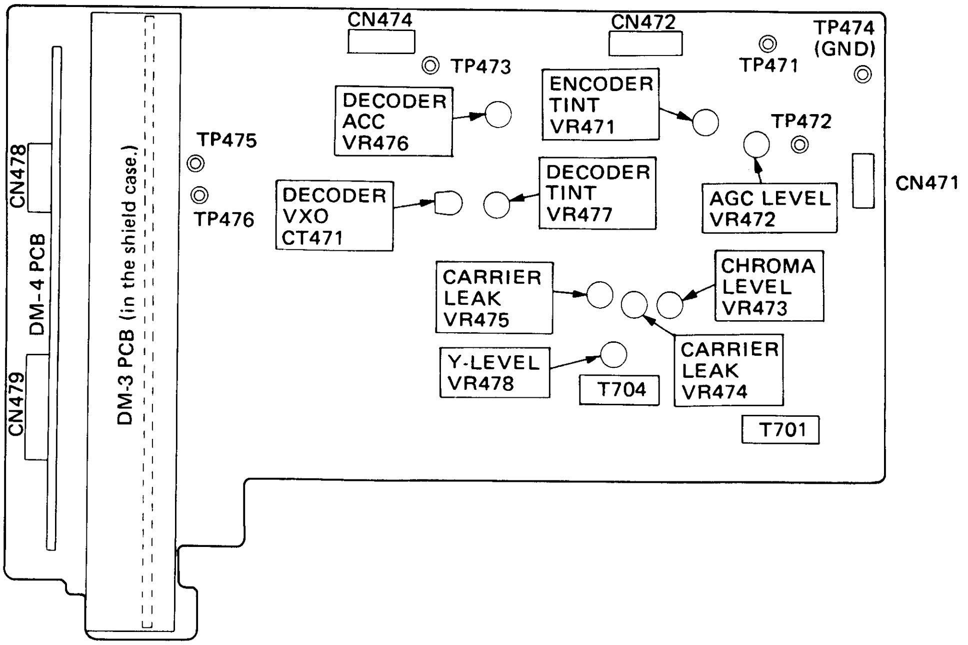
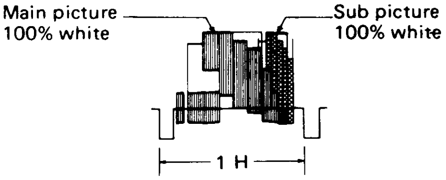
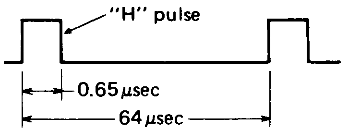

CN474
TP473
CN472
TP474
(GND)
TP471
DECODER
ACC
VR476
ENCODER
TINT
VR471
TP472
TP475
TP476
DECODER
VXO
CT471
DECODER
TINT
VR477
AGC LEVEL
VR472
CN471
CN478
DM-4 PCB
CN479
DM-3 PCB (in the shield case.)
CARRIER
LEAK
VR475
CHROMA
LEVEL
VR473
Y-LEVEL
VR478
T704
CARRIER
LEAK
VR474
T701

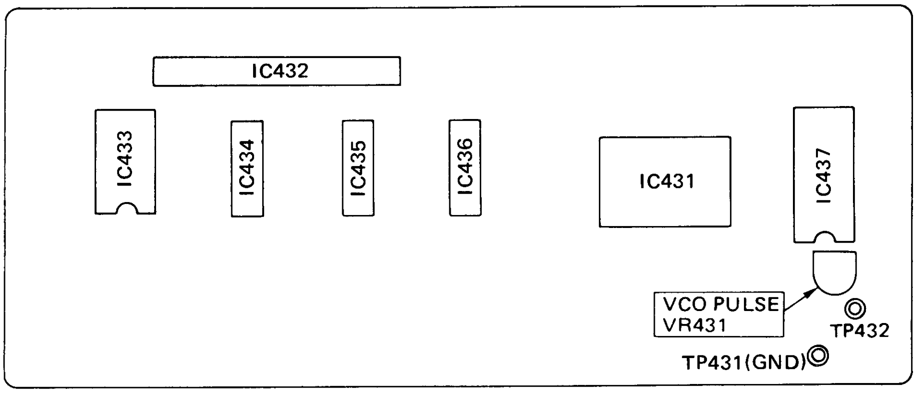
Fig. 2-4-1 DM-1 PCB (Parts side view)

SETTING BEFORE ADJUSTMENT ····· Item No. 8 and No. 9

(1) Set the colour-bar signal from RF colour-bar generator or the colour-bar signal from alignment tape cassette (VHJ-0008) to the sub picture.

(2) Set the LINE-in signal to the main picture.

No.	Item	Input	Mode	Point	Location	Remark
8	SUB PICTURE Y-LEVEL	LINE: Colour-bar from Colour-bar generator	E-E (AV) PinP	TP471 (DM-1 PCB)	VR478 (DM-1 PCB)	 Main picture 100% white Sub picture 100% white 1 H 1. Adjust VR478 so that the same level of main and sub picture signal of 100% white level.
9	VCO PULSE WIDTH	LINE: Colour-bar from Colour-bar generator	E-E (AV)	TP432 (DM-3 PCB)	VR431 (DM-3 PCB)	 "H" pulse 0.65μsec 64μsec 1. Remove the cover of shield case. 2. Adjust VR431 so that the "H" pulse width is 0.65 ± 0.05 μsec.



IC432
IC433
IC434
IC435
IC436
IC431
IC437
VCO PULSE
VR431
TP432
TP431(GND)

Fig. 2-4-2 DM-3 PCB (Parts side view)

2-5. AUDIO CIRCUIT ADJUSTMENT

SETTING BEFORE ADJUSTMENT

- The audio output terminal of the audio frequency oscillator should be terminated at 600 ohms.
- The audio output terminal of the VCR should be terminated at 47 killo ohms (L ch and R ch).
- TU/AV select button . . . . [AV] position
- AV INPUT select switch . . . . [AV] position
- SP/LP select button . . . . [SP] position
- AUDIO output select button . . . . [L] and [R] position
- REC LEVEL control (L ch and R ch) . . . . Center (click stop) position

AUDIO FM CIRCUIT ..... AD-1 PCB

NOTE (1): The AUDIO FM section adjustment has separate adjustment items for the L ch and R ch.
The R ch adjustments are included in parentheses.

(2): 'No-signal record mode' is not to supply any signal to the AUDIO INPUT terminal.

No.	Item	Input	Mode	Point	Location	Remark
1	E-E AUDIO OUTPUT LEVEL BALANCE	Audio signal (1KHz, −7dBs) from Audio frequency oscillator	E-E	AUDIO OUTPUT CN851 pin 4 (Lch) pin 6 (R ch) (CP-1 PCB)	VR224	1. Set the REC LEVEL controls (L, R) to the center (click stop) position. 2. Adjust VR224 so that the same level of Lch and Rch both audio ontput terminals.
2	AF CARRIER FREQUENCY	None	REC	TP01 (L ch) TP02 (R ch)	VR233 (L ch) VR243 (R ch)	1. Connect a frequency counter to TP01 (TP02). 2. Adjust VR233 (VR243) so that the carrier frequency is 1.4 MHz (1.8 MHz) ± 5 KHz.
3	PLAYBACK LEVEL	Alignment cassette (VHJ-0020)	PLAY	AUDIO OUTPUT CN851 pin 4 (Lch) pin 6 (R ch) (CP-1 PCB)	VR232 (Lch) VR242 (Rch)	Adjust VR232 (VR242) so that the playback level is −7 ± 0.3dBs.
4	MODULA-TION LEVEL	Audio signal (400Hz, −7dBs) from Audio frequency oscillator	E-E	TP03 (Lch) TP04 (Rch)	VR231 (Lch) VR241 (Rch)	1. Connect an audio frequency oscillator to audio input terminals, and set for an oscillation output of −7dBs, 400Hz sine wave. 2. Connect the AC voltmeter to the AUDIO OUT terminal. 3. Set the REC LEVEL control (Lch and Rch) so that the level is −7 dBs. 4. Connect the AC voltmeter to TP03 (TP04). 5. Adjust VR231 so that the modulation level is −14.0 dBs. 6. Adjust VR241 so that the modulation level is −14.5dBs.
5	RECORD-ING/ PLAYBACK OUTPUT LEVEL	Audio signal (400Hz, −7dBs) from Audio signal oscillator	REC ↓ PLAY	AUDIO OUTPUT CN851 pin 4 (Lch) pin 6 (R ch) (CP-1 PCB)	VR231 (Lch) VR241 (Rch)	1. Put the VCR in the REC mode, and play-back the recorded part. 2. Adjust VR231 (VR241) so that the audio output level is −7 ± 0.3dBs.

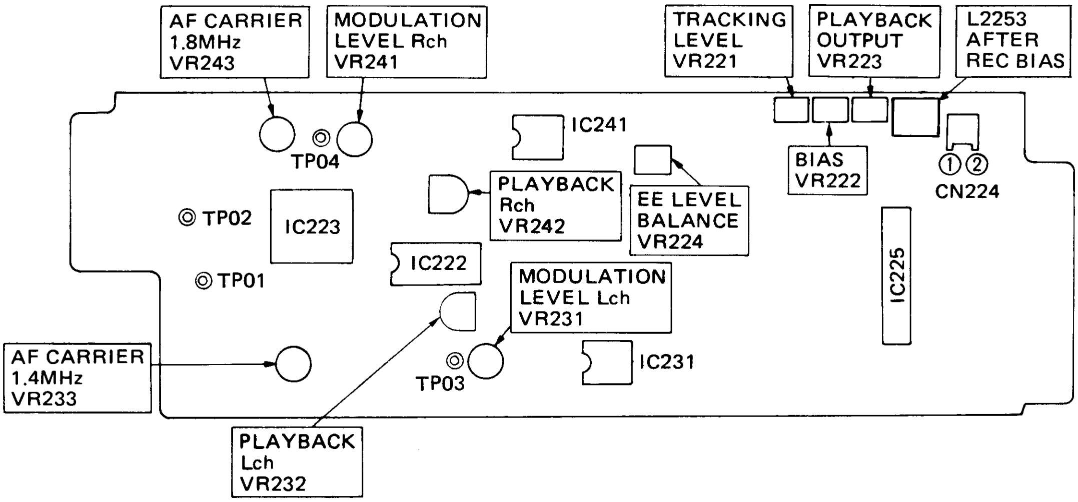

AF CARRIER
1.8MHz
VR243
MODULATION
LEVEL Rch
VR241
TRACKING
LEVEL
VR221
PLAYBACK
OUTPUT
VR223
L2253
AFTER
REC BIAS
IC241
TP04
BIAS
VR222
①②
CN224
TP02
IC223
PLAYBACK
Rch
VR242
EE LEVEL
BALANCE
VR224
IC222
TP01
MODULATION
LEVEL Lch
VR231
IC225
AF CARRIER
1.4MHz
VR233
TP03
IC231
PLAYBACK
Lch
VR232

Fig. 2-5-1 AD-1 PCB (Foil side view)

NORMAL AUDIO CIRCUIT ..... AD-1 PCB

NOTE (1): Item No. 4 apply to the model VHR-D4890 (Australia, New Zealand) only.
NOTE (2): 'No-signal record mode' is not to supply any signal to AUDIO INPUT terminal.
NOTE (3): Press the AUDIO output select button to the Mono (No indication) position.

No.	Item	Input	Mode	Point	Location	Remark
1	BIAS	No-signal	REC	CN224 pin 1 CN224 pin 2 (GND)	VR222	1. Insert VHS Blank tape to the VCR. 2. Press the TU/AV button on the remote control unit to the AV position and put the VCR in the no-signal record mode. 3. Adjust VR222 so that the level is 26 mV rms.
2	AFTER RECORD-ING BIAS	No-signal	AFTER RECORD-ING	CN224 pin 1 CN224 pin 2 (GND)	L2253	1. Insert the VHS Blank tape to the VCR. 2. Set the VCR to the no-signal and after recording mode. 3. Adjust L2253 so that the level is 26 mV rms.
3	PLAY-BACK OUTPUT LEVEL	Audio singal (1KHz, –3.8 dBs) from Audio frequency oscillator	REC ↓ PLAY	AUDIO OUTPUT CN851 pin 4 or pin 6 (CP-1 PCB)	VR223	Adjust VR223 so that the recorded 1 KHz output level becomes –3.8 dBs in the PLAY mode.
4	PLAY-BACK OUTPUT LEVEL	Audio singal (1KHz, –7 dBs) from Audio frequency oscillator	REC PLAY	AUDIO OUTPUT RCA pin jack L or R (Rear panel)	VR223	Adjust VR223 so that the recorded 1 KHz output level becomes –7 dBs in the PLAY mode.

2-6. LEVEL METER CIRCUIT ADJUSTMENT..... TM-1 and AD-1 PCB

No.	Item	Input	Mode	Point	Location	Remark
1	AUDIO LEVEL METER	Audio signal from Audio frequency oscillator	E-E	AUDIO OUTPUT terminal (Lch, Rch)	VR714 (Lch) VR715 (Rch) (TM-1 PCB)	1. Set the TU/AV button to the AV position and the AV INPUT select switch to the AV position. 2. Select the Level meter switch to the AUDIO LEVEL position. 3. Set the AUDIO output select button to the "L" and "R" position. 4. Connect an audio frequency oscillator to AUDIO INPUT terminals, and set for an oscillation output of 1 KHz, −7 dBs sine wave. 5. Connect the AC voltmeter to the AUDIO OUTPUT terminals. 6. Set the REC LEVEL control so that the audio output signal level is −13 dBs. 7. Adjust VR714 and VR715 so that illuminates the −10dB LED. 8. Set the REC LEVEL control so that the audio output signal level is −13.5 dBs. 9. Adjust VR714 and VR715 so that confirm only the −10dB LED goes out.
2	Hi-Fi TRACKING METER	Alignment cassette (VHJ0020)	PLAY	TRACKING METER	VR221 (AD-1 PCB)	1. Select the Level meter switch to the HiFi TRACKING position and set the tracking control to the best point. 2. Playback the alignment cassette and set the tracking control to the best point. 3. Adjust VR221 so that the "+4 dB" LEDs illuminates.

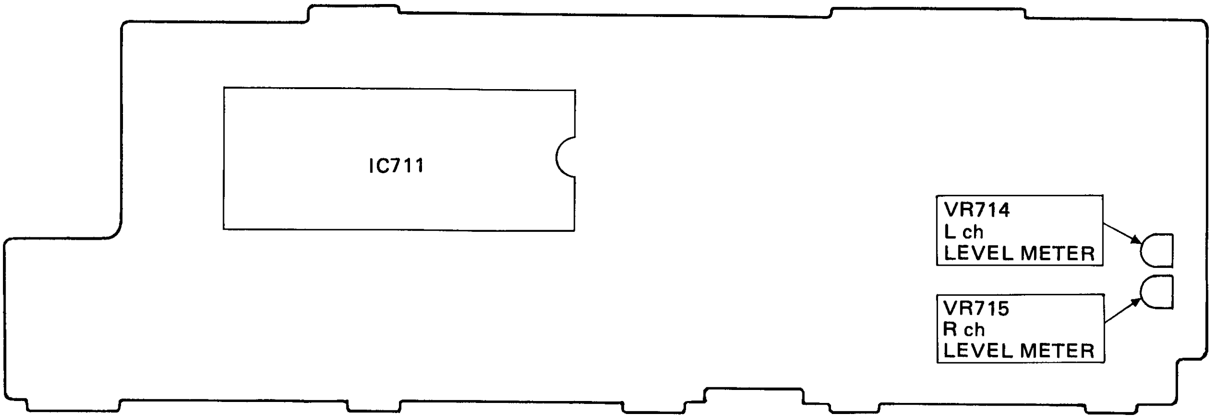


Fig. 2-6-1 TM-1 PCB (Parts side view)

2-7. TUNER IF CIRCUIT ADJUSTMENT ..... TN-1 Unit

No.	Item	Input	Mode	Point	Location	Remark
1	RF AGC	TV broadcast	E-E	TV screen	VR6101	1. Remove the rear terminal board from CP-1 PCB (see Fig. 2-2-1). 2. Turn VR6101 in the direction which causes snow to appear, then in the opposite direction until the snow just disappears.

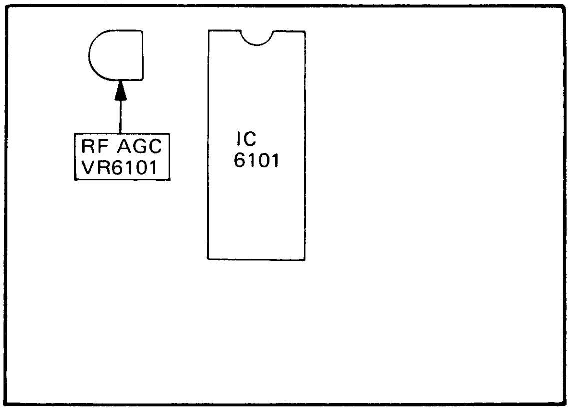


Fig. 2-7-1 TN-1 Unit (Parts side view)

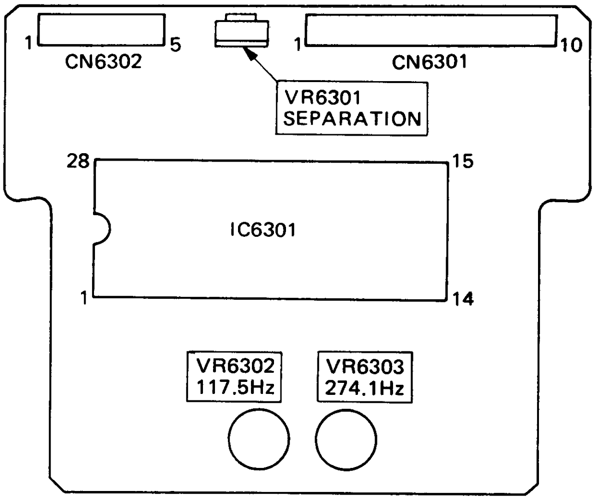


Fig. 2-8-1 TN-3 PCB (Parts side view)

2-8. MTS (Multiplex TV System) DECODER CIRCUIT ADJUSTMENT..... TN-3 PCB

NOTE (1): This adjustment apply to the model VHR-D4890G, I and VHR-D4890 (Australia).
NOTE (2): The VR6301 is accessible from the foil side of CP-1 PCB (Fig. 2-2-1).

No.	Item	Input	Mode	Point	Location	Remark
1	STEREO SEPARATION	Audio signal (R ch...1 KHz 100% mod. L ch...400Hz unmod.) from Audio MPX TV signal generator	E-E	AUDIO OUTPUT CN851 pin 4 (Lch) (CP-1 PCB)	VR6301	1. Set the pilot signal for the stereo mode. With the L ch unmodulated, provide 1 KHz 100% modulation on the R ch. 2. Connect an oscilloscope to the audio output terminal (L ch) and adjust VR6301 for minimum waveform peak-to-peak value.
2	STEREO (117.5Hz)	TV broadcast (Stereo)	E-E	IC6301 pin 5	VR6302	1. Select the TV channel to stereo programme. 2. Adjust VR6302 so that the waveform is maximize.
3	BILINGUL (274.1Hz)	TV broadcast (Bilingul)	E-E	IC6301 pin 6	VR6303	1. Select the TV channel to bilingul programme. 2. Adjust VR6303 so that the waveform is maximize.

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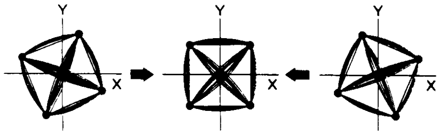
2-9. NICAM DECODER CIRCUIT ADJUSTMENT .....TN-5 PCB

NOTE (1): This adjustment apply to the model VHR-D4890E, ES, ES (Spain) and VHR-D4890 (New Zealand).
(2): Do not use a metalic screw driver.
(3): Use the same type of probe (10 MHz, 15 pF) for CH-1 and CH-2.

No.	Item	Input	Mode	Point	Location	Remark
1	CARRIER (VCXO)	NICAM system broadcasting	E-E	TP01 (CH-1) TP02 (CH-2) (TN-5 PCB)	CT671 (TN-5 PCB)	 1. Receive a NICAM-system (approx. 70 dBμ) broadcasting. 2. Set the oscilloscope to X–Y mode. Set VOLTAGE/DIV. of CH-1(X) and CH-2(Y) to 20 mV/DIV.. 3. Connect CH-1(X) and CH-2(Y) of the oscilloscope to the TP01; CH-1 and TP02; CH-2. 4. Adjust CT671 so that the resurge waveform becomes parallel to the X and Y axes.

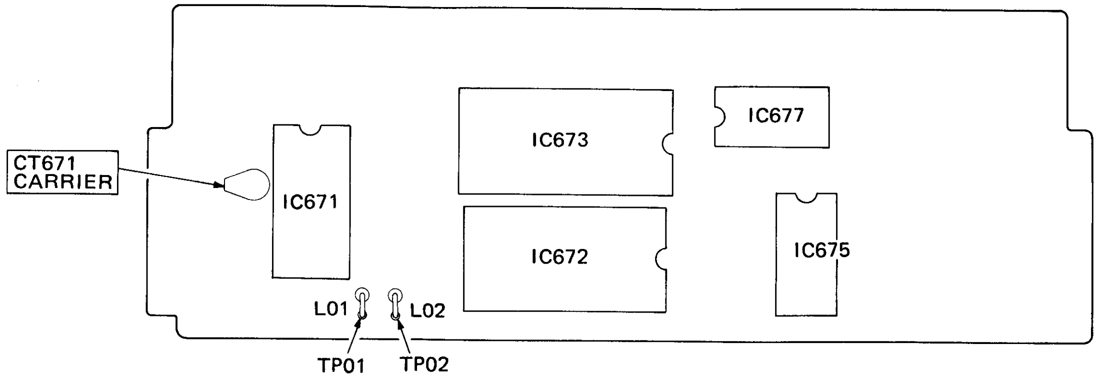


Fig. 2-9-1 TN-5 PCB (Parts side view)

Feb./'89/6000 NS Printed in Japan

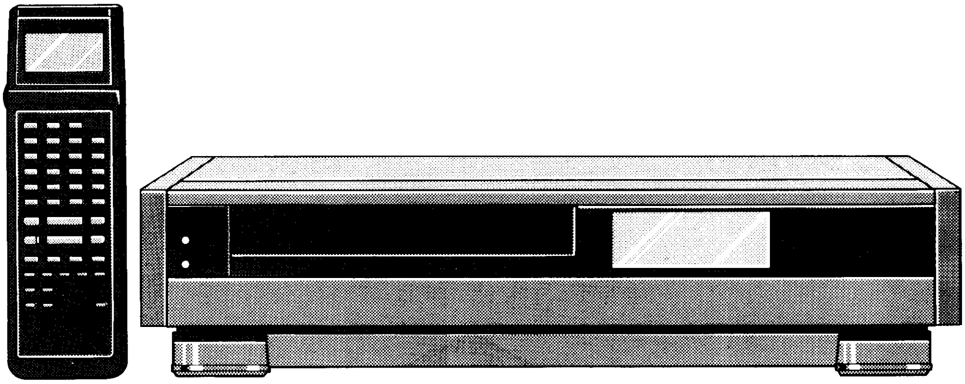
SANYO Electric Co., Ltd.
Osaka, Japan

SANYO

Parts List & Circuit Diagrams

Colour Video Cassette Recorder

VHR-D4890E
(U.K.)



S-VHS 625 VHS PAL

Hi-Fi HQ

DIGITAL

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Circuit Diagram

Please see other materials with Reference No. given in table below.

Materials	Model No.	Reference No.
Service Manual	VHR-D4890 Series	WM-530228
Mechanism Manual	P88 MECHANISM	WM-22534
Training Manual	VHR-4100 Series	WM-22342
Training Manual	Digital	WM-530116

PRODUCT SAFETY NOTICE

The components designated by a symbol (⚠) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the Parts List. Do not deviate from the resistance, wattage and voltage ratings shown.

NOTE: Parts order must contain Model Number, Part Number and Description.

DP4PHSL/E 143 115 84

MC-Service

REFERENCE No. WM-530298

ACCESSORIES

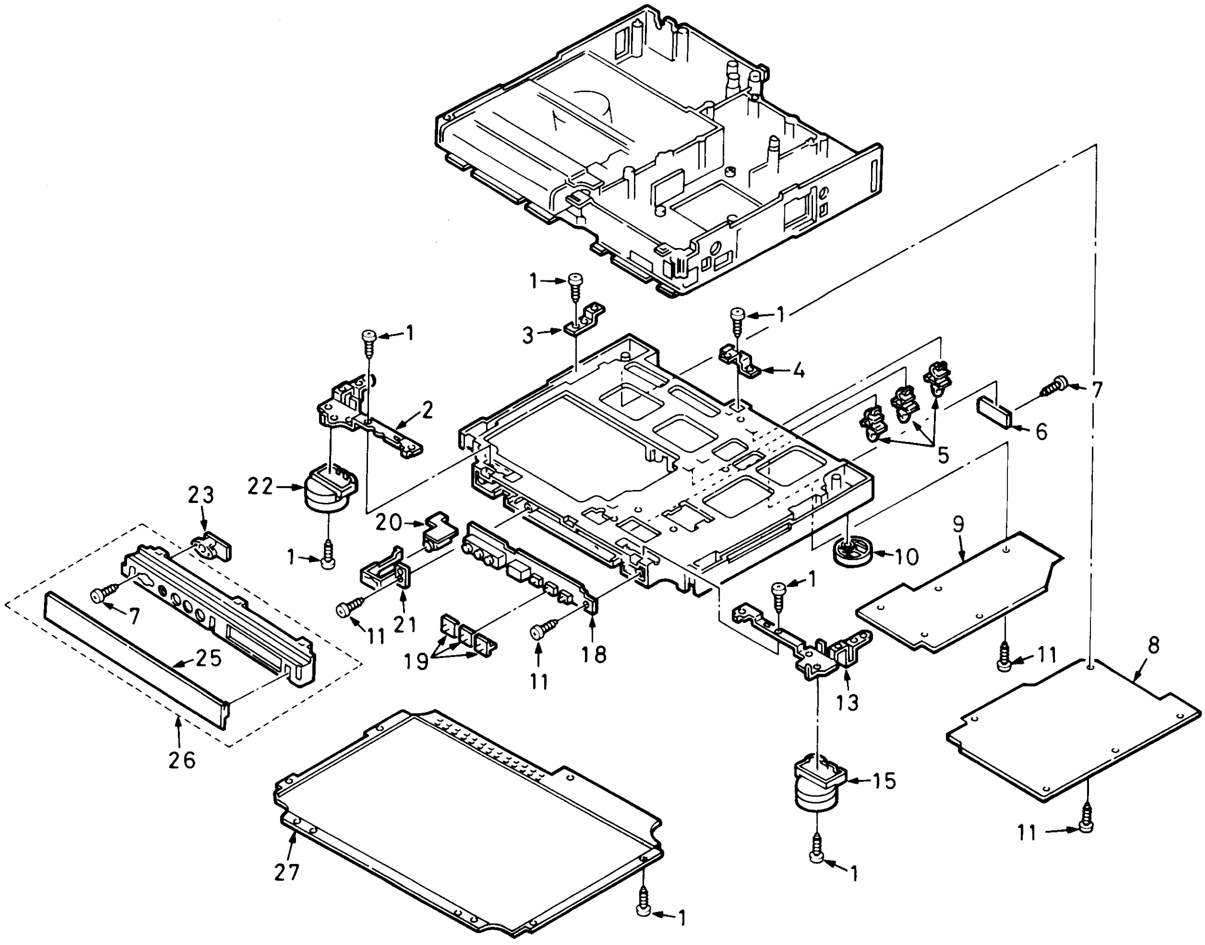
LOCATION	PARTS NO.	DESCRIPTION
	613 088 7955	INSTRUCTION MANUAL
	613 089 3017	PLUG ASSY
	613 091 7607	REMOCON
	613 011 7359	CORD,ANT CABLE
	613 011 7328	CORD,SVH-S

PACKING MATERIALS

LOCATION	PARTS NO.	DESCRIPTION
	613 088 7788	CORR CASE,INNER
	613 091 3982	CUSHION,INNER,FRONT
	613 091 3999	CUSHION,INNER,BACK
	613 095 0765	POLYE COVER,INNER

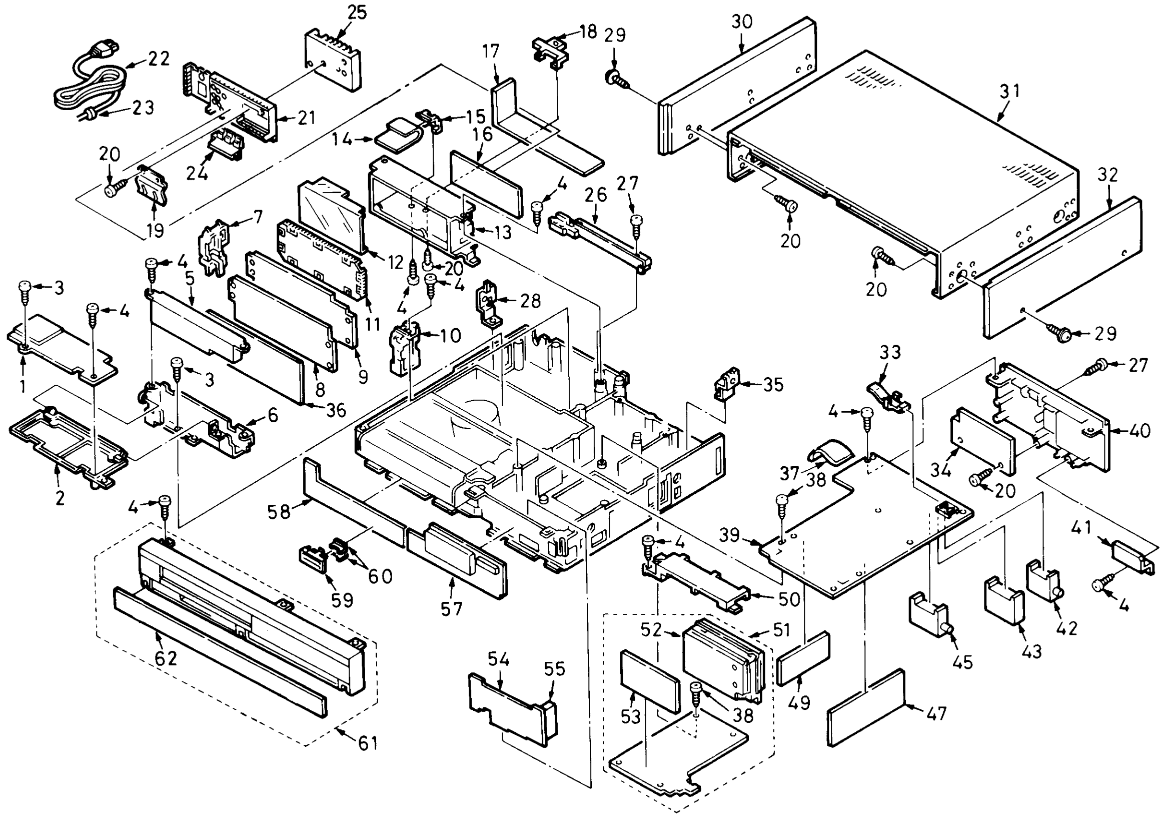
CABINET & CHASSIS PARTS 1

LOCATION	PARTS NO.	DESCRIPTION
1	411 021 4005	SCR S-TPG BIN 3X12
2	613 081 1370	BRACKET
3	613 081 1356	BRACKET
4	613 081 1363	BRACKET
5	613 088 7658	HOLDER,VD-1
6	613 087 5068	COMPL,TB-2
7	411 023 1101	SCR S-TPG PAN 2.6X10
8	613 088 1083	COMPL,VD-1
9	613 092 3783	COMPL,CP-2
10	613 081 1295	STAND,BACK
11	411 021 4203	SCR S-TPG BIN 3X12
13	613 081 1387	BRACKET
15	613 082 2932	ASSY,STAND,RIGHT
18	613 087 5013	COMPL,TM-5
19	613 079 4970	KNOB
20	613 087 5020	COMPL,TM-6
21	613 079 5038	BRACKET,TM-6
22	613 082 2918	ASSY,STAND,LEFT
23	613 087 5037	COMPL,TM-7
25	613 088 7269	ASSY,DOOR
26	613 088 7221	ASSY,CABINET,FRONT
27	613 080 0275	COVER,BOTTOM



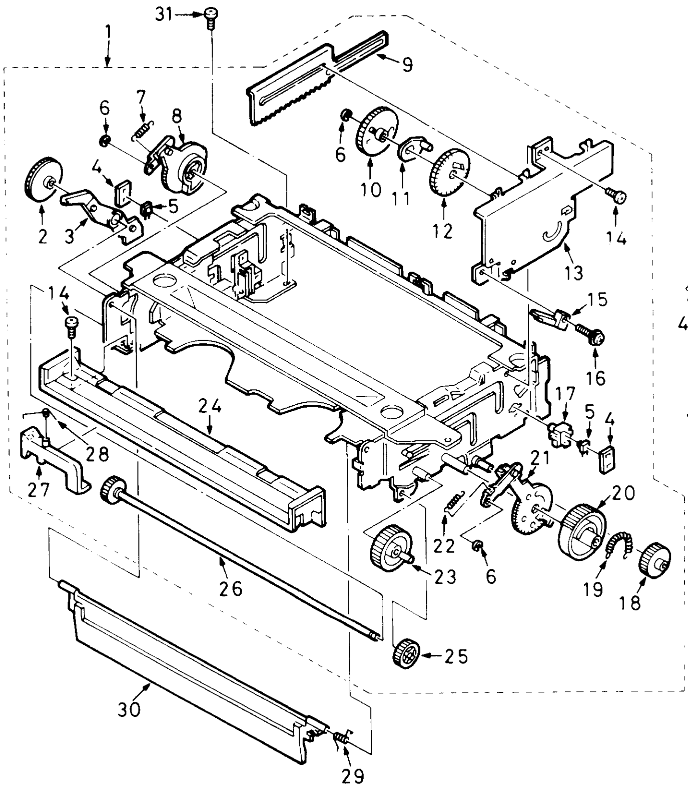
CABINET & CHASSIS PARTS 2

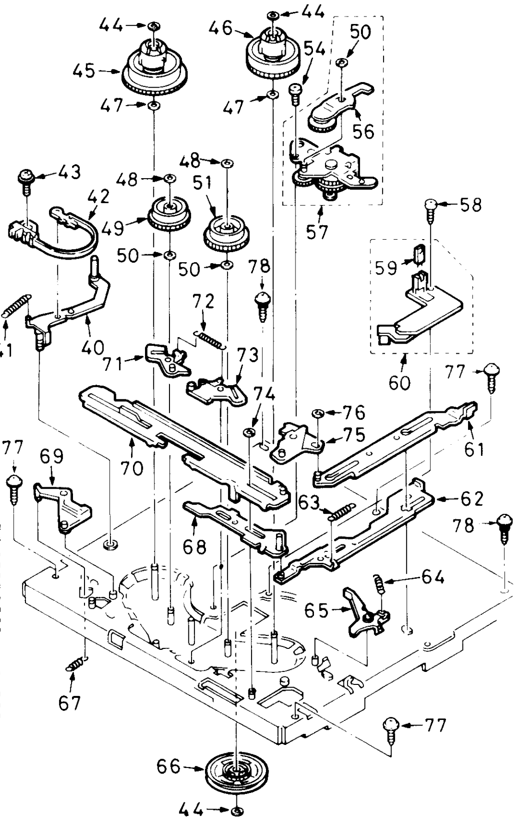
LOCATION		PARTS NO.	DESCRIPTION
1		613 087 4962	COMPL,VD-3
2		613 081 6719	HOLDER(INCLUDE VD-3)
3		411 046 9702	SCR PAN+SW+W 3X6
4		411 021 4005	SCR S-TPG BIN 3X12
5		613 088 1816	COMPL,VP-1
6		613 081 3992	BRACKET
7		613 079 9692	HOLDER(INCLUDE AD-1)
8		613 088 2332	COMPL,AD-1
9		613 088 2349	COMPL,AD-2
10		613 079 9708	HOLDER(INCLUDE AD-1)
11		613 081 0410	SHIELD(INCLUDE PW-1)
12	⚠	613 081 0441	INSULATOR(INCLUDE PW-1)
13		613 081 0397	SHIELD(INCLUDE PW-1)
14	⚠	613 082 9795	INSULATOR,IC501(INCLUDE PW-1)
15		613 089 8982	BRACKET(INCLUDE PW-1)
16		613 088 8709	COMPL,PW-1
17		613 081 0434	RADIATOR(INCLUDE PW-1)
18		613 081 0380	BRACKET(INCLUDE PW-1)
19		613 087 3538	BRACKET(INCLUDE PW-1)
20		411 021 6405	SCR S-TPG BIN 3X8
21		613 081 0403	SHIELD(INCLUDE PW-1)
22	⚠	613 086 0514	CORD,POWER
23		613 053 6686	FIXER(INCLUDE PW-1)
24		613 088 8716	COMPL,PW-2
25		613 087 2548	RADIATOR(INCLUDE PW-1)
26		613 077 3487	BLIND
27		411 021 4104	SCR S-TPG BIN 3X12
28		613 022 0738	BRACKET,CABINET
29		412 024 7604	SPECIAL SCREW
30		613 090 8780	PANEL,SIDE,LEFT
31		613 081 7785	COVER,TOP
32		613 090 8773	PANEL,SIDE,RIGHT
33		613 059 4198	SPRING PLATE
34		613 090 8636	COMPL,TB-1
35		613 048 6912	BRACKET
36		613 079 0859	SHIELD
37		613 088 9195	FLEXIBLE FLAT CABLE
38		411 021 4203	SCR S-TPG BIN 3X12
39		613 088 2615	COMPL,CP-A
40		613 079 9623	TERMINAL(INCLUDE CP-A)
41		613 077 3159	BRACKET(INCLUDE CP-A)
42		613 079 2358	MODULATOR,RF
OR		613 079 2365	MODULATOR,RF
43		613 079 2143	IF PACK
45		613 079 2006	TUNER
47		613 088 3742	COMPL,TN-5
49		613 082 0563	COMPL,SY-2
50		613 082 5773	HOLDER,TM-3
51		613 090 3747	COMPL,DM-1
52		613 081 4913	COMPL,DM-3
53		613 090 3716	COMPL,DM-4
54		613 091 4248	COMPL,TM-3
55		613 086 3577	COMPL,TM-4(INCLUDE TM-3)
57		613 088 2257	COMPL,TM-1
58		613 087 5051	COMPL,TM-2
59		613 079 0934	BLIND,REC VOLUME
60		613 079 0378	KNOB,REC VOLUME
61		613 088 7191	ASSY,CABINET,FRONT
62		613 088 7399	DOOR



MECHANISM PARTS 1

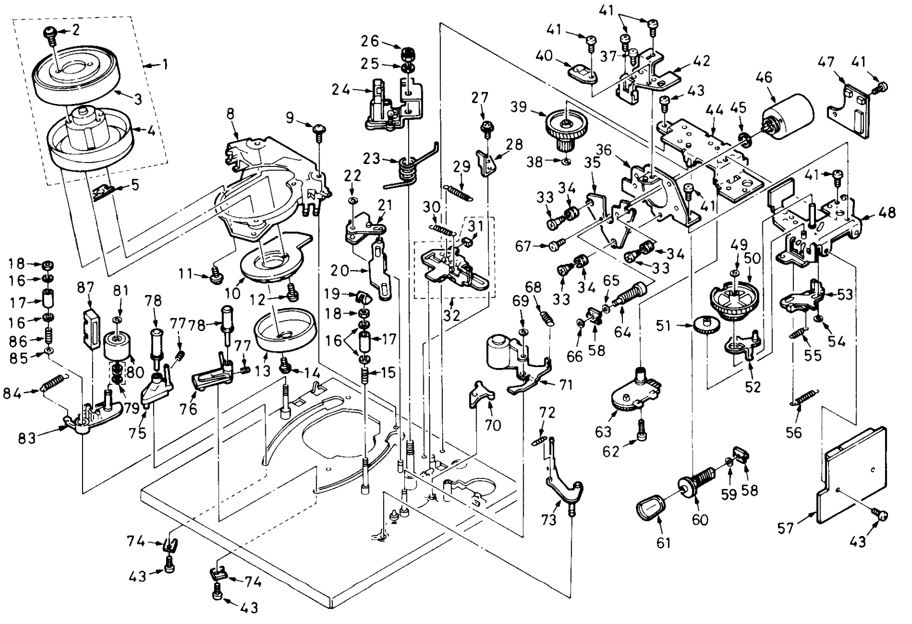
LOCATION	PARTS NO.	DESCRIPTION
1	613 085 7149	COMPL,CASSETTE MECHANISM
2	613 022 2572	GEAR,IDLER L
3	613 022 2275	LEVER,DOOR OPENER
4	613 022 0585	LID
5	407 098 3201	PHOTO COUPLE PN150SAN
6	411 015 9801	RING E 2.3
7	613 022 1643	SPRING,LINK L
8	613 022 0073	ASSY,GEAR,LEVER L
9	613 022 2695	RACK
10	613 022 2633	GEAR,LOCK
11	613 021 9916	ASSY,LEVER,PINION
12	613 022 2626	GEAR,PINION
13	613 021 9657	ASSY,BRACKET,GEAR
14	411 027 1305	SCR S-TPG BIN 2.6X4
15	613 006 4479	SPECIAL SWITCH
OR	613 095 0949	SW,SPECIAL
16	411 106 9208	SCR PAN+SW+W 2X9
17	613 022 0936	HOLDER,TRANSISTOR
18	613 022 2619	GEAR,IDLER
19	613 022 1667	SPRING,GEAR MAIN
20	613 022 2596	GEAR,MAIN
21	613 022 0097	ASSY,GEAR,LEVER R
22	613 022 1674	SPRING,LINK R
23	613 022 2602	GEAR,IDLER R
24	613 022 4064	BOARD,UNDER
25	613 022 2558	GEAR,COUPLE R
26	613 022 0226	ASSY,ROD
27	613 022 2237	LEVER,SAFETY SW
28	613 022 1827	SPRING,SAFETY SW
29	613 022 1803	SPRING,DOOR
30	613 086 4352	CASSETTE DOOR
31	411 001 8702	SCR BIN 3X6
40	613 097 8257	ASSY,LEVER,TENSION
41	613 085 7996	SPRING,LEVER TENSION
42	613 021 9701	ASSY,HOLDER,BAND
43	411 036 2805	SCR PAN+SW+W 2.6X6
44	411 109 1605	WASHER Y 2.6X6X0.25
45	613 078 8375	ASSY,REEL,SUPPLY
46	613 022 0110	ASSY,REEL,TAKE UP
47	412 021 5306	SPECIAL WASHER 3.1X6X0.3T
OR	412 015 8900	SPECIAL WASHER 3.1X6X0.4T
OR	412 015 8504	SPECIAL WASHER 3.1X6X0.5T
48	411 109 1506	WASHER Y 2.1X6X0.25
OR	411 109 1407	WASHER Y 2.1X5X0.25
49	613 085 7231	GEAR,REEL SUPPLY
OR	613 098 7174	GEAR,REEL SUPPLY
50	412 026 7305	SPECIAL WASHER 2.6X6X0.25
51	613 022 2480	GEAR,REEL TAKE UP
OR	613 098 7181	GEAR,REEL TAKE UP
54	411 031 0905	SCR BIN 2.6X4
56	613 022 0134	ASSY,IDLER
57	613 085 7101	COMPL,IDLER,CLUTCH
58	411 021 3107	SCR S-TPG BIN 2.6X8
59	407 016 7205	LED LN59
60	613 078 6302	COMPL,MC-4
61	613 021 9985	ASSY,SLIDE,ACT PLATE
62	613 021 9992	ASSY,SLIDE,C BRAKE
63	613 022 1612	SPRING,RETURN SLIDE
64	613 022 1506	SPRING,SUB T
65	613 022 0196	ASSY,BRAKE,SUB T
OR	613 098 0106	ASSY,BRAKE,SUB T
66	613 077 3647	PULLEY,REEL
67	613 022 1490	SPRING,SUB SUPPLY
68	613 022 2374	SLIDE,ACT BRAKE
69	613 084 8871	BRAKE,SUB SUPPLY
70	613 022 0004	ASSY,SLIDE,M PLATE
71	613 080 9216	ASSY,BRAKE,SUPPLY
72	613 022 1544	SPRING,MAIN BRAKE
OR	613 086 2914	SPRING,MAIN BRAKE
73	613 080 9209	ASSY,BRAKE,TAKE UP
74	411 109 3005	WASHER Y 2.6X5X0.5
75	613 022 2015	LEVER,CONT PLATE
76	411 109 1407	WASHER Y 2.1X5X0.25
77	411 021 7907	SCR S-TPG BIN 4X12
78	412 030 2402	SPECIAL SCREW





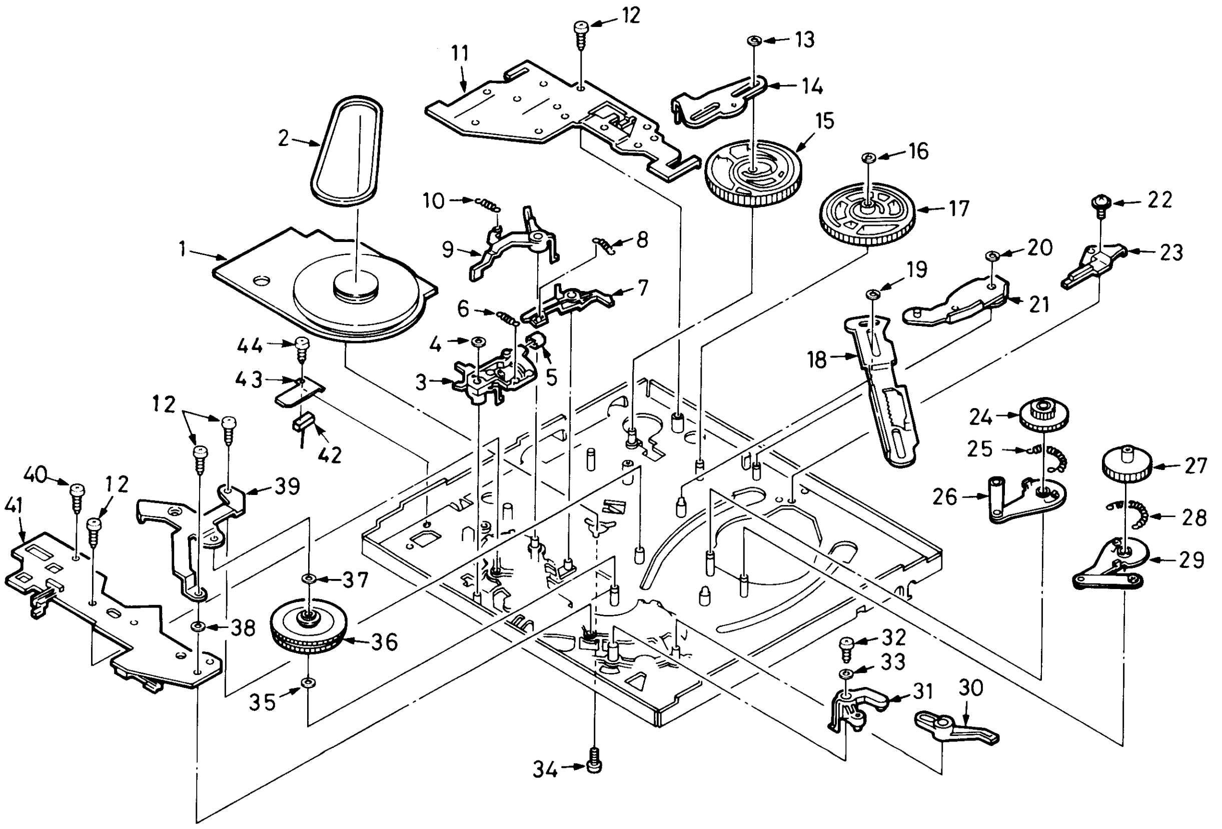
MECHANISM PARTS 2

LOCATION	PARTS NO.	DESCRIPTION
1	613 091 7539	COMPL,CYLINDER,5H7P-SD
2	411 038 1608	SCR PAN+W 3X8
3	613 091 7546	ASSY,CYLINDER,UPR 5H7P-SD
4	613 086 7889	ASSY,CYLINDER,LWR 7
5	613 079 8152	SPACER,MOTOR
OR	613 097 2163	SPACER,MOTOR
8	613 022 1001	BASE,CYLINDER
OR	613 088 9072	BASE,CYLINDER
9	411 047 7509	SCR PAN+FLG 3X6
10	613 085 7279	STATOR,MOTOR CYL
11	411 047 5000	SCR PAN+FLG 2.6X8
OR	412 030 9708	SPECIAL SCREW 2.6X8
12	411 044 9209	SCR PAN+SW 2.3X8
13	613 022 4019	ROTOR,MOTOR CYL
14	411 044 9001	SCR PAN+SW 2.3X6
15	613 022 1766	SPRING,ADJUST GUIDE
16	613 053 3227	SPECIAL WASHER
17	613 058 3307	TAPE GUIDE
18	412 026 2607	SPECIAL NUT
19	613 085 2434	CAP
20	613 021 9961	ASSY,SLIDE,ACT PINCH
21	613 021 9800	ASSY,LEVER,CAM PINCH
22	411 109 2008	WASHER Y 3.1X8X0.5
23	613 022 1797	SPRING,ACE HEAD
24	613 079 7971	COMPL,BRACKET,HEAD
25	613 051 4615	SPACER
26	412 015 8207	SPECIAL NUT
27	411 120 0007	SCR PAN+SW+W 2.6X5
28	613 022 0752	BRACKET,STOPPER
29	613 022 1575	SPRING,LINK LOCK
30	613 022 1582	SPRING,SLIDE BRAKE
31	613 022 2725	DAMPER
32	613 022 0059	ASSY,SLIDE,CAM
33	412 021 1407	SPECIAL SCREW
34	613 079 1030	DAMPER,MOTOR
35	613 079 0989	PLATE,MOTOR
36	613 079 0736	BRACKET,STAND
37	411 021 3107	SCR S-TPG BIN 2.6X8
38	411 109 1902	WASHER Y 3.1X6X0.5
39	613 077 3579	GEAR,HELICAL
40	613 089 4328	COMPL,SENSOR DEW
41	411 040 2303	SCR PAN 2.6X5
42	613 077 3180	BRACKET,HOLDER
43	411 031 1209	SCR BIN 2.6X5
44	613 079 6868	ASSY,BRACKET,MOTOR
45	613 077 3616	DAMPER,WORM
46	613 021 9527	ASSY,LOADING MOTOR
47	613 079 8992	COMPL,MC-3
48	613 078 7705	ASSY,BRACKET,FRONT
49	613 027 0504	WASHER 4.1X6.5X0.5
50	613 077 3586	GEAR,HELICAL FRONT
51	613 022 2534	GEAR,FRONT LOAD
52	613 021 9824	ASSY,LEVER,FRONT
53	613 022 0011	ASSY,SLIDE,FRONT
54	411 109 3005	WASHER Y 2.6X5X0.5
55	613 022 1636	SPRING,LEVER ACT
56	613 022 1629	SPRING,LEVER LOAD
57	613 079 8985	COMPL,MC-2
57-1	403 001 3108	CERAMIC 0.1U Z 16V,INCLUDE MC-2
57-2	613 009 8306	SOCKET 26P,INCLUDE MC-2
58	613 077 3227	HOLDER,WORM
59	613 027 0627	WASHER 2.1X6X0.5
60	613 078 8344	ASSY,WORM,LOAD
61	613 022 2985	BELT,LOADING
62	411 002 5700	SCR PAN 2.6X12
63	613 077 4361	ROTARY SWITCH
64	613 078 8320	ASSY,WORM,FRONT
65	613 027 0375	WASHER 2.1X4.0X0.13
66	613 053 2381	SPECIAL WASHER
67	411 040 0507	SCR PAN 2.6X3
68	613 022 1483	SPRING,PINCH ROLLER
69	411 109 2107	WASHER Y 3.6X6X0.5
70	613 078 8160	COMPL,LEVER,ACT BRAKE
71	613 022 0158	COMPL,PINCH ROLLER
72	613 022 1568	SPRING,REVIEW LEVER
73	613 021 9886	ASSY,LEVER,REV GUIDE
74	613 022 1919	PLATE,GUIDE
75	613 021 9725	ASSY,BASE,ROLLER S
76	613 021 9732	ASSY,BASE,ROLLER T
77	411 063 0904	SCR SET HEX-SCT 2X3
78	613 022 0233	ASSY,GUIDE,ROLLER
79	613 089 9057	BEARING,BALL
80	613 089 9040	ROLLER,IMPEDANCE
81	411 109 2602	WASHER Y 1.5X4X0.25
83	613 093 8305	ASSY,LEVER,FE HEAD
84	613 022 1698	SPRING,ERASE HEAD
85	411 109 1704	WASHER Y 6.4X10X0.25
86	613 022 1773	SPRING,GUIDE SUPPLY
87	613 086 7452	HEAD,FULL ERASE



MECHANISM PARTS 3

LOCATION	PARTS NO.	DESCRIPTION
1	613 022 4491	MOTOR,CAPSTAN
OR	613 080 8929	MOTOR,CAPSTAN
2	613 022 2978	BELT,REEL DRIVE
3	613 021 9848	ASSY,LEVER,CLUTCH
4	411 125 4208	RING CS 3.5
5	613 079 1023	DAMPER,LEVER CLUTCH
6	613 022 1520	SPRING,LEVER CLUTCH
7	613 082 3434	LEVER,CHANGE CLUTCH
8	613 022 1711	SPRING,CHANGE CLUTCH
9	613 081 7518	ASSY,BRAKE,CAPSTAN
10	613 098 2285	SPRING,CAPSTAN
11	613 022 0837	BRACKET,REINFORCE
12	411 021 3107	SCR S-TPG BIN 2.6X8
13	411 109 2008	WASHER Y 3.1X8X0.5
14	613 021 9978	ASSY,SLIDE,CAM PLATE
15	613 022 2701	CAM,MODE
16	411 109 1902	WASHER Y 3.1X6X0.5
17	613 022 2718	CAM,MAIN
18	613 022 2664	RACK,LOAD
19	411 109 1803	WASHER Y 2.6X6X0.5
20	411 109 2107	WASHER Y 3.6X6X0.5
OR	411 109 2206	WASHER Y 3.6X8X0.5
21	613 021 9794	ASSY,LEVER,CAM LOAD
22	411 047 6809	SCR PAN+FLG 3X4
23	613 021 9763	ASSY,EARTH,CYL
24	613 022 2435	GEAR,LOAD TAKE UP
OR	613 090 6380	GEAR,LOAD T
25	613 022 1551	SPRING,GEAR LOAD T
26	613 021 9879	ASSY,LEVER,LOAD T
27	613 022 2428	GEAR,LOAD SUPPLY
OR	613 090 6373	GEAR,LOAD S
28	613 022 1704	SPRING,GEAR LOAD S
29	613 021 9862	ASSY,LEVER,LOAD S
30	613 022 2039	LEVER,RETURN TENSION
31	613 021 9817	ASSY,LEVER,CONTROL
OR	613 091 3104	ASSY,LEVER,CONTROL (LOC.32&33 NOT USED)
32	411 022 8903	SCR S-TPG PAN 2.3X12
OR	411 066 7702	SCR TPG PAN 2.3X5
33	411 087 6005	WASHER V 2.6X7.5X0.5
OR	411 087 4902	WASHER V 2.3X6.5X0.5
34	411 040 2303	SCR PAN 2.6X5
35	412 015 8603	SPECIAL WASHER
36	613 093 6448	ASSY,GEAR,FRICTION
37	411 109 1605	WASHER Y 2.6X6X0.25
38	411 102 9905	WASHER Y 3.2X8X1
39	613 079 8121	BRACKET,PULLEY
40	411 100 0300	SCR S-TPG BIN 2.6X5
41	613 080 7830	COMPL,MC-1
41-1	401 024 6700	CARBON 100 JA 1/6W R 2,INCLUDE MC-1
OR	401 012 4404	CARBON 100 JA 1/4W R 2,INCLUDE MC-1
41-2	401 026 0607	CARBON 270 JA 1/6W R 1,3,INCLUDE MC-1
OR	401 017 0708	CARBON 270 JA 1/4W R 1,3,INCLUDE MC-1
41-3	613 022 4538	SPECIAL,SWITCH,FRONT END,INCLUDE MC-1
41-4	613 022 4545	SPECIAL SWITCH,E-P,INCLUDE MC-1
41-5	407 094 1300	PHOTO COUPLE SPI-315-04-C,INCLUDE MC-1
OR	407 043 0101	PHOTO DIODE ON2170-R,INCLUDE MC-1
41-6	613 022 1155	SPACER,PHOTO SENSOR,INCLUDE MC-1
42	613 079 8282	SW,PUSH
43	613 079 1528	PCB
44	411 046 7906	SCR PAN+SW+W 2.6X5



ELECTRICAL PARTS

NOTE;

*Materials of Capacitors and Resistors are abbreviated as follows;

Resistors	
MT-FILE	Metal Film Resistor
MT-GLAZE	Metal Glaze Resistor
OXIDE-MT	Oxide Netal Film Resistor
Capacitors	
MT-POLYEST	Metallized Polyester Capacitor
MT-COMPO	Metallized Composite Capacitor
TA-SOLID	Tantalum Solid Capacitor
AL-SOLID	Aluminum Solid Capacitor
NP-ELECT	Non-Polarized Electrolytic Capacitor
OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
DL-ELECT	Double Layered Electrolytic Capacitor

*Tolerance of Capacitor(10pF over) and Resistor are noted with follow symboles.

F ············±1%	G ············±2%	J ············±5%	K ············±10%
M ············±20%	N ············±30%	Z ············+80% ~ −20%	

*N.S.P. : Not availabe as service parts.

LOCATION	PARTS NO.	DESCRIPTION
COMPL,CP-A		
COMPL.NO.	613 088 2615	
	613 082 5223	HOLDER,TN-5
VIDEO CIRCUIT(VD-A)		
B1601	405 018 2501	TR 2SC3399-AC
B1691	405 018 2501	TR 2SC3399-AC
C1606	403 039 3507	ELECT 470U M 6.3V
C1608	403 024 1501	CERAMIC 39P J 50V
C1612	403 040 2209	ELECT 22U M 10V
C1631	403 040 2209	ELECT 22U M 10V
C1632	403 040 2209	ELECT 22U M 10V
C1633	403 039 3507	ELECT 470U M 6.3V
C1634	403 001 1906	CERAMIC 0.01U M 16V
C1635	403 042 3006	ELECT 100U M 16V
C1641	403 042 3006	ELECT 100U M 16V
C1642	403 001 1906	CERAMIC 0.01U M 16V
C1643	403 001 1906	CERAMIC 0.01U M 16V
C1644	403 001 1906	CERAMIC 0.01U M 16V
C1646	403 070 7205	CERAMIC 150P J 50V
C1648	403 041 8804	ELECT 10U M 16V
C1649	403 071 5408	CERAMIC 220P J 50V
D1603	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1605	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1606	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1608	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1631	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1632	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1641	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1642	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1643	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1644	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1651	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D1652	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT

LOCATION	PARTS NO.	DESCRIPTION
IC161	409 168 8703	IC NJM2235D
L1605	613 015 6730	HF CHOKE 100UH K
L1641	613 015 6730	HF CHOKE 100UH K
Q1601	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1605	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1631	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1632	405 006 1806	TR 2SA933S-T93-R
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 004 5103	TR 2SA608-G-SPA-AC
Q1641	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1642	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1643	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 004 5103	TR 2SA608-G-SPA-AC
OR	405 006 1806	TR 2SA933S-T93-R
Q1644	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 004 5103	TR 2SA608-G-SPA-AC
OR	405 006 1806	TR 2SA933S-T93-R
Q1645	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
R1608	401 016 4707	CARBON 22K JA 1/4W
R1610	401 021 2903	CARBON 5.6K JA 1/4W
R1611	401 021 2903	CARBON 5.6K JA 1/4W
R1612	401 016 4707	CARBON 22K JA 1/4W
R1613	401 021 0602	CARBON 56 JA 1/4W
R1619	401 012 5609	CARBON 1K JA 1/4W
R1620	401 021 2903	CARBON 5.6K JA 1/4W
R1621	401 013 5202	CARBON 1.2K JA 1/4W
R1625	401 021 1807	CARBON 560 JA 1/4W
R1630	401 012 5609	CARBON 1K JA 1/4W
R1631	401 019 0904	CARBON 390 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R1633	401 019 9501	CARBON 47 JA 1/4W
R1634	401 016 2505	CARBON 220 JA 1/4W
R1635	401 022 6702	CARBON 75 JA 1/4W
R1636	401 012 6903	CARBON 10K JA 1/4W
R1641	401 012 5609	CARBON 1K JA 1/4W
R1642	401 014 8509	CARBON 1.6K JA 1/4W
R1643	401 012 5609	CARBON 1K JA 1/4W
R1645	401 020 0702	CARBON 470 JA 1/4W
R1646	401 022 6702	CARBON 75 JA 1/4W
R1647	401 012 4404	CARBON 100 JA 1/4W
R1648	401 020 0702	CARBON 470 JA 1/4W
R1649	401 022 6702	CARBON 75 JA 1/4W
R1650	401 012 4404	CARBON 100 JA 1/4W
R1651	401 016 2505	CARBON 220 JA 1/4W
R1652	401 012 6903	CARBON 10K JA 1/4W
R1653	401 012 6903	CARBON 10K JA 1/4W
R1661	401 012 5609	CARBON 1K JA 1/4W
R1691	401 012 6903	CARBON 10K JA 1/4W
R1692	401 012 6903	CARBON 10K JA 1/4W

AUDIO CIRCUIT(AD-A)

D2551	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D2552	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D2553	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
R2509	401 023 1607	CARBON 820 JA 1/4W
R2510	401 015 2605	CARBON 1.8K JA 1/4W
R2561	401 012 5609	CARBON 1K JA 1/4W

SYSTEM CONTROL CIRCUIT(SY-A)

B3201	405 063 9708	TR DTC144EL-TL2
C3072	403 121 9509	CERAMIC 0.1U Z 50V
C3073	403 038 1603	ELECT 100U M 6.3V
C3074	403 022 7703	CERAMIC 33P J 50V
C3075	403 022 7703	CERAMIC 33P J 50V
C3076	403 121 9509	CERAMIC 0.1U Z 50V
C3201	403 038 5403	ELECT 22U M 6.3V
CN301	613 009 4735	SOCKET 26P
D3001	407 004 9709	DIODE DSK10C-BT
D3140	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3201	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
IC301	410 060 0801	IC LC66516A-3952
IC305	409 157 9407	IC BX7603
R3001	401 012 5609	CARBON 1K JA 1/4W
R3013	401 012 5609	CARBON 1K JA 1/4W
R3014	401 012 5609	CARBON 1K JA 1/4W
R3021	401 012 5609	CARBON 1K JA 1/4W
R3022	401 012 5609	CARBON 1K JA 1/4W
R3023	401 012 5609	CARBON 1K JA 1/4W
R3027	401 012 5609	CARBON 1K JA 1/4W
R3084 ⚠	402 036 4401	FUSIBLE RES 3.3 JA 1/2W
R3092	401 012 8006	CARBON 100K JA 1/4W
R3093	401 012 8006	CARBON 100K JA 1/4W
R3094	401 012 8006	CARBON 100K JA 1/4W
R3095	401 012 8006	CARBON 100K JA 1/4W
R3096	401 023 4509	CARBON 820K JA 1/4W
R3097	401 012 5609	CARBON 1K JA 1/4W
R3098	401 012 5609	CARBON 1K JA 1/4W
R3099	401 016 4707	CARBON 22K JA 1/4W
R3100	401 012 5609	CARBON 1K JA 1/4W
R3101	401 012 5609	CARBON 1K JA 1/4W
R3102	401 012 5609	CARBON 1K JA 1/4W
R3111	401 012 6903	CARBON 10K JA 1/4W
R3121	401 014 4006	CARBON 1.5K JA 1/4W
R3122	401 014 4006	CARBON 1.5K JA 1/4W
R3123	401 019 1802	CARBON 3.9K JA 1/4W
R3139	401 012 5609	CARBON 1K JA 1/4W
R3140	401 012 5609	CARBON 1K JA 1/4W
R3141	401 012 5609	CARBON 1K JA 1/4W
R3142	401 020 1907	CARBON 4.7K JA 1/4W
R3143	401 016 7906	CARBON 2.4K JA 1/4W
R3144	401 012 5609	CARBON 1K JA 1/4W
R3145	401 012 5609	CARBON 1K JA 1/4W
R3146	401 020 1907	CARBON 4.7K JA 1/4W
R3151	401 020 2805	CARBON 47K JA 1/4W
R3167	401 012 6903	CARBON 10K JA 1/4W
R3168	401 012 6903	CARBON 10K JA 1/4W
R3170	401 012 5609	CARBON 1K JA 1/4W
R3171	401 012 8006	CARBON 100K JA 1/4W
R3201	401 015 4609	CARBON 180K JA 1/4W
R3401	401 020 1907	CARBON 4.7K JA 1/4W
RB304	613 081 7167	RESISTOR PACK 3.9KX5
OR	613 081 7150	RESISTOR PACK 3.9KX5
OR	613 086 7513	R-NETWORK,3.9KX5
XF301	613 016 6869	CERAMIC RESONATOR 4MHZ
OR	613 016 7026	CERAMIC RESONATOR 4MHZ

SERVO CIRCUIT(SV-A)

B3501	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
B3602	405 003 7603	TR 2SA1345-AC
OR	405 000 2205	TR DTA144ES-DCTP
B3603	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
B3610	405 003 7603	TR 2SA1345-AC
OR	405 000 2205	TR DTA144ES-DCTP
B3611	405 003 7603	TR 2SA1345-AC
OR	405 000 2205	TR DTA144ES-DCTP
B3901	405 018 2600	TR 2SC3400-AC
B3902	405 003 7900	TR 2SA1348-AC
B3952	405 000 6104	TR DTC144ES-DCTP
B3954	405 000 6104	TR DTC144ES-DCTP
B3955	405 003 7603	TR 2SA1345-AC
OR	405 000 2205	TR DTA144ES-DCTP
B3956	405 018 2501	TR 2SC3399-AC
OR	405 000 6104	TR DTC144ES-DCTP
B3957	405 000 2205	TR DTA144ES-DCTP
C3501	403 059 6502	POLYESTER 0.022U K 50V
C3502	403 002 8508	CERAMIC 0.015U K 25V
C3503	403 001 8806	CERAMIC 6800P K 16V
C3505	403 002 8508	CERAMIC 0.015U K 25V
C3506	403 038 5403	ELECT 22U M 6.3V
C3507	403 038 5403	ELECT 22U M 6.3V
C3508	403 001 5003	CERAMIC 2200P K 16V
C3509	403 001 3801	CERAMIC 1500P K 16V
C3510	403 001 8806	CERAMIC 6800P K 16V
C3511	403 038 5403	ELECT 22U M 6.3V
C3512	403 038 5403	ELECT 22U M 6.3V
C3513	403 057 6801	POLYESTER 0.012U J 50V
C3514	403 071 6207	CERAMIC 220P K 50V
C3515	403 041 9405	ELECT 10U M 16V
C3516	403 050 7102	ELECT 3.3U M 50V

LOCATION	PARTS NO.	DESCRIPTION
C3517	403 073 7004	CERAMIC 470P K 50V
C3518	403 162 1609	NP-ELECT 33U M 6.3V
C3519	403 069 1207	CERAMIC 1000P K 50V
C3520	403 061 3605	POLYESTER 0.039U J 50V
C3521	403 062 9101	POLYESTER 6800P J 50V
C3522	403 057 2902	POLYESTER 0.1U K 50V
C3523	403 057 9604	POLYESTER 0.12U K 50V
C3526	403 086 2607	NP-ELECT 1U M 50V
C3527	403 001 1609	CERAMIC 0.01U K 16V
C3528	403 048 2508	ELECT 0.22U M 50V
C3529	403 069 1207	CERAMIC 1000P K 50V
C3530	403 049 0800	ELECT 1U M 50V
C3531	403 001 1609	CERAMIC 0.01U K 16V
C3533	403 039 2609	ELECT 47U M 6.3V
C3534	403 121 9509	CERAMIC 0.1U Z 50V
C3537	403 039 2609	ELECT 47U M 6.3V
C3538	403 039 2609	ELECT 47U M 6.3V
C3539	403 004 4607	CERAMIC 0.068U K 25V
C3540	403 061 7306	POLYESTER 4700P J 50V
C3541	403 069 1207	CERAMIC 1000P K 50V
C3542	403 068 9402	CERAMIC 100P K 50V
C3601	403 061 9706	POLYESTER 0.047U J 50V
C3602	403 057 2001	POLYESTER 0.1U J 50V
C3603	403 057 2001	POLYESTER 0.1U J 50V
C3604	403 057 2001	POLYESTER 0.1U J 50V
C3605	403 001 1609	CERAMIC 0.01U K 16V
C3606	403 086 2607	NP-ELECT 1U M 50V
C3607	403 057 5507	POLYESTER 1200P J 50V
C3953	403 121 9509	CERAMIC 0.1U Z 50V
C3955	403 024 6902	CERAMIC 390P J 50V
C3960	403 050 0707	ELECT 2.2U M 50V
D3501	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3502	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3503	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3504	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3505	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3522	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3601	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3602	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3604	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3606	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3607	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3608	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3609	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3610	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3611	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3612	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3613	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3614	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3615	407 007 9904	DIODE GMA01-BT

LOCATION	PARTS NO.	DESCRIPTION
D3615	407 012 4406	DIODE 1SS133-T-77
D3616	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3617	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3618	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3624	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3625	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3630	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3631	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3651	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3652	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3901	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3902	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3903	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3953	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D3954	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
IC351	409 165 5606	IC LC7418-8078
IC352	409 159 8606	IC LA7122S
IC392	409 002 2607	IC BA226
Q3501	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
Q3503	405 081 7205	TR 2SD1920-TL2-Q
OR	405 081 7106	TR 2SD1920-TL2-R
OR	405 081 7007	TR 2SD1920-TL2-S
Q3602	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
Q3603	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
R3501	401 018 4804	CARBON 33K JA 1/4W
R3502	401 012 8006	CARBON 100K JA 1/4W
R3503	401 012 8006	CARBON 100K JA 1/4W
R3506	401 018 5702	CARBON 330K JA 1/4W
R3507	401 014 5102	CARBON 15K JA 1/4W
R3508	401 014 6000	CARBON 150K JA 1/4W
R3509	401 020 2805	CARBON 47K JA 1/4W
R3510	401 020 2805	CARBON 47K JA 1/4W
R3511	401 012 6903	CARBON 10K JA 1/4W
R3512	401 018 5702	CARBON 330K JA 1/4W
R3513	401 017 2702	CARBON 27K JA 1/4W
R3514	401 014 6000	CARBON 150K JA 1/4W
R3516	401 016 5704	CARBON 220K JA 1/4W
R3518	401 016 4707	CARBON 22K JA 1/4W
R3519	401 016 4707	CARBON 22K JA 1/4W
R3520	401 021 9902	CARBON 620K JA 1/4W
R3521	401 022 8508	CARBON 750K JA 1/4W
R3522	401 014 6000	CARBON 150K JA 1/4W
R3523	401 012 8006	CARBON 100K JA 1/4W
R3524	401 012 8006	CARBON 100K JA 1/4W
R3525	401 018 7508	CARBON 360 JA 1/4W
R3526	401 020 7800	CARBON 510 JA 1/4W
R3527	401 020 7800	CARBON 510 JA 1/4W
R3528	401 014 6000	CARBON 150K JA 1/4W
R3529	401 020 2805	CARBON 47K JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R3531	401 012 5609	CARBON 1K JA 1/4W
R3532	401 014 4006	CARBON 1.5K JA 1/4W
R3533	401 016 3700	CARBON 2.2K JA 1/4W
R3535	401 012 6903	CARBON 10K JA 1/4W
R3538	401 012 6903	CARBON 10K JA 1/4W
R3539	401 014 4006	CARBON 1.5K JA 1/4W
R3541	401 012 6903	CARBON 10K JA 1/4W
R3542	401 012 6903	CARBON 10K JA 1/4W
R3544	401 012 8006	CARBON 100K JA 1/4W
R3546	401 012 5609	CARBON 1K JA 1/4W
R3547	401 012 5609	CARBON 1K JA 1/4W
R3548	401 012 5609	CARBON 1K JA 1/4W
R3549	401 014 6000	CARBON 150K JA 1/4W
R3550	401 012 5609	CARBON 1K JA 1/4W
R3551	401 012 5609	CARBON 1K JA 1/4W
R3561	401 012 8006	CARBON 100K JA 1/4W
R3562	401 016 4707	CARBON 22K JA 1/4W
R3563	401 016 0006	CARBON 20K JA 1/4W
R3602	401 012 5609	CARBON 1K JA 1/4W
R3604	401 014 6000	CARBON 150K JA 1/4W
R3605	401 014 5102	CARBON 15K JA 1/4W
R3606	401 016 8705	CARBON 240K JA 1/4W
R3607	401 012 8006	CARBON 100K JA 1/4W
R3609	401 020 2805	CARBON 47K JA 1/4W
R3613	401 015 4609	CARBON 180K JA 1/4W
R3614	401 015 4609	CARBON 180K JA 1/4W
R3616	401 014 6000	CARBON 150K JA 1/4W
R3617	401 014 6000	CARBON 150K JA 1/4W
R3619	401 021 4006	CARBON 56K JA 1/4W
R3620	401 022 8003	CARBON 75K JA 1/4W
R3622	401 016 4707	CARBON 22K JA 1/4W
R3623	401 013 6308	CARBON 12K JA 1/4W
R3624	401 012 8006	CARBON 100K JA 1/4W
R3625	401 012 6903	CARBON 10K JA 1/4W
R3628	401 012 5609	CARBON 1K JA 1/4W
R3629	401 014 6000	CARBON 150K JA 1/4W
R3632	401 012 8006	CARBON 100K JA 1/4W
R3633	401 015 4609	CARBON 180K JA 1/4W
R3634	401 013 6308	CARBON 12K JA 1/4W
R3639	401 020 1907	CARBON 4.7K JA 1/4W
R3643	401 022 8003	CARBON 75K JA 1/4W
R3648	401 012 5609	CARBON 1K JA 1/4W
R3650	401 020 1907	CARBON 4.7K JA 1/4W
R3653	401 016 4707	CARBON 22K JA 1/4W
R3901	401 017 1705	CARBON 2.7K JA 1/4W
R3904	401 012 8006	CARBON 100K JA 1/4W
R3965	401 020 2805	CARBON 47K JA 1/4W
R3966	401 020 2805	CARBON 47K JA 1/4W
R3970	401 020 1907	CARBON 4.7K JA 1/4W
R3971	401 020 2805	CARBON 47K JA 1/4W
R3973	401 020 1907	CARBON 4.7K JA 1/4W
R3974	401 023 4509	CARBON 820K JA 1/4W
VR351	613 001 9110	SEMI VR 220KB
OR	613 001 9462	SEMI VR 200KB
VR361	613 001 9486	SEMI VR 500KB
OR	613 001 9134	SEMI VR 470KB
VR362	613 001 9486	SEMI VR 500KB
OR	613 001 9134	SEMI VR 470KB

POWER SUPPLY CIRCUIT(PW-A)

LOCATION	PARTS NO.	DESCRIPTION
C5401	403 001 1906	CERAMIC 0.01U M 16V
C5402	403 041 9405	ELECT 10U M 16V
D5401	407 078 2705	DIODE 1SS244-T-77
D5402	407 053 6209	ZENER DIODE MTZ5.1A-T-77
D5403	407 078 2705	DIODE 1SS244-T-77
D5404	407 053 6704	ZENER DIODE MTZ5.6B-T-77
D5460	407 078 2705	DIODE 1SS244-T-77
D5461	407 078 2705	DIODE 1SS244-T-77
Q5401	405 043 6000	TR 2SC3807
Q5402	405 016 9601	TR 2SC3070-AE
Q5403	405 006 7006	TR 2SA984K-E-AA
OR	405 006 7204	TR 2SA984K-F-AA
Q5404	405 024 0102	TR 2SD545-E-NP-AA
OR	405 024 0409	TR 2SD545-F-NP-AA
Q5406	405 084 8100	TR 2SC2960-E-SPA-AC
OR	405 084 8209	TR 2SC2960-F-SPA-AC
OR	405 084 8308	TR 2SC2960-G-SPA-AC
R5401	401 020 1907	CARBON 4.7K JA 1/4W
R5402	401 021 2903	CARBON 5.6K JA 1/4W
R5403	401 019 7200	CARBON 430 JA 1/4W
R5404	401 020 2805	CARBON 47K JA 1/4W
R5405	401 018 0202	CARBON 300K JA 1/4W
R5406	401 021 8103	CARBON 620 JA 1/4W
R5407 ⚠	402 004 2309	FUSIBLE RES 5.6 JA 1/4W
R5408	401 020 1907	CARBON 4.7K JA 1/4W
R5409	401 020 1907	CARBON 4.7K JA 1/4W
R5460	401 021 2903	CARBON 5.6K JA 1/4W

TUNER CIRCUIT(TN-A)

LOCATION	PARTS NO.	DESCRIPTION
B6051	405 003 7603	TR 2SA1345-AC
B6052	405 003 7603	TR 2SA1345-AC
B6053	405 063 9906	TR DTC124EL-TL2
B6054	405 063 9906	TR DTC124EL-TL2
B6055	405 003 7603	TR 2SA1345-AC
B6056	405 018 2501	TR 2SC3399-AC
C6001	403 067 5603	MT-COMPO 0.1U J 50V
OR	403 065 8002	MT-POLYEST 0.1U J 63V
C6004	403 067 5603	MT-COMPO 0.1U J 50V
OR	403 065 8002	MT-POLYEST 0.1U J 63V
C6005	403 046 9905	ELECT 4.7U M 25V
C6051	403 070 7205	CERAMIC 150P J 50V
D6053	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6054	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6055	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6056	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6057	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6058	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6059	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6060	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6061	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6062	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6063	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6070	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
D6071	407 012 4406	DIODE 1SS133-T-77
OR	407 007 9904	DIODE GMA01-BT
L6003	613 014 0852	HF CHOKE 10UH K
L6004	613 014 0852	HF CHOKE 10UH K

LOCATION	PARTS NO.	DESCRIPTION
L6006	613 014 0852	HF CHOKE 10UH K
L6007	613 014 0852	HF CHOKE 10UH K
L6051	613 015 3593	HF CHOKE
R6004	401 018 5702	CARBON 330K JA 1/4W
R6005	401 016 5704	CARBON 220K JA 1/4W
R6048	401 019 0904	CARBON 390 JA 1/4W
R6049	401 019 0904	CARBON 390 JA 1/4W
R6051	401 015 1509	CARBON 180 JA 1/4W
R6052	401 015 1509	CARBON 180 JA 1/4W
R6053	401 019 1802	CARBON 3.9K JA 1/4W
R6054	401 018 3708	CARBON 3.3K JA 1/4W

TIMER CIRCUIT(TM-A)

LOCATION	PARTS NO.	DESCRIPTION
C7001	403 001 1906	CERAMIC 0.01U M 16V
C7002	403 001 1906	CERAMIC 0.01U M 16V
C7003	403 121 9509	CERAMIC 0.1U Z 50V
C7004	403 050 2800	ELECT 22U M 50V
C7005	403 071 2001	CERAMIC 180P K 50V
C7006	403 067 5603	MT-COMPO 0.1U J 50V
OR	403 065 8002	MT-POLYEST 0.1U J 63V
C7007	403 067 7300	MT-COMPO 0.33U J 50V
OR	403 115 1007	MT-POLYEST 0.33U J 63V
D7001	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7002	407 053 7701	ZENER DIODE MTZ6.8C-T-77
IC701	409 148 5005	IC M6M80021P
OR	409 151 7904	IC M6M80011P
IC702	409 019 6209	IC LA7910
IC703	409 026 8203	IC L5631
OR	409 057 5103	IC UPC574J
Q7001	405 016 5009	TR 2SC2960-F
OR	405 016 5108	TR 2SC2960-G
Q7002	405 006 7006	TR 2SA984K-E-AA
OR	405 006 7204	TR 2SA984K-F-AA
R7001	401 019 1802	CARBON 3.9K JA 1/4W
R7002	401 012 6903	CARBON 10K JA 1/4W
R7003	401 018 4804	CARBON 33K JA 1/4W
R7004	401 012 6903	CARBON 10K JA 1/4W
R7005	401 020 2805	CARBON 47K JA 1/4W
R7006	401 016 4707	CARBON 22K JA 1/4W
R7007	401 020 1907	CARBON 4.7K JA 1/4W
R7008	402 004 2101	FUSIBLE RES 470 JA 1/4W
R7009	401 021 2903	CARBON 5.6K JA 1/4W
R7010	401 014 5102	CARBON 15K JA 1/4W

RF CONVERTER CIRCUIT(CV-A)

LOCATION	PARTS NO.	DESCRIPTION
C6601	403 038 1603	ELECT 100U M 6.3V
C6602	403 038 1603	ELECT 100U M 6.3V
D6601	407 004 9709	DIODE DSK10C-BT
OR	407 005 8701	DIODE ERA15-02A-V5
L6601	613 015 6631	HF CHOKE 15UH K
L6602	613 015 6631	HF CHOKE 15UH K

COMPL,CP-2

COMPL.NO. 613 092 3783

VIDEO CIRCUIT(VD-B)

LOCATION	PARTS NO.	DESCRIPTION
B1401	405 018 2501	TR 2SC3399-AC
B1402	405 018 2501	TR 2SC3399-AC
B1421	405 018 2501	TR 2SC3399-AC
B1422	405 018 2501	TR 2SC3399-AC
B1423	405 003 7603	TR 2SA1345-AC
B1461	405 018 2501	TR 2SC3399-AC
B1501	405 018 2501	TR 2SC3399-AC
B1502	405 018 2501	TR 2SC3399-AC
B1535	405 018 2501	TR 2SC3399-AC
B1537	405 018 2501	TR 2SC3399-AC
B1538	405 003 7603	TR 2SA1345-AC
B1539	405 018 2501	TR 2SC3399-AC
B1540	405 018 2501	TR 2SC3399-AC
B1542	405 018 2808	TR 2SC3402-AC
B1545	405 018 2808	TR 2SC3402-AC
B1549	405 018 2501	TR 2SC3399-AC
B1950	405 003 7603	TR 2SA1345-AC
C1401	403 041 9405	ELECT 10U M 16V
C1402	403 001 1906	CERAMIC 0.01U M 16V
C1420	403 030 6309	CERAMIC 68P J 50V
C1421	403 042 8308	ELECT 22U M 16V
C1422	403 042 8308	ELECT 22U M 16V
C1424	403 001 1906	CERAMIC 0.01U M 16V
C1425	403 001 1906	CERAMIC 0.01U M 16V
C1426	403 043 9601	ELECT 47U M 16V
C1427	403 001 1906	CERAMIC 0.01U M 16V
C1428	403 039 2609	ELECT 47U M 6.3V
C1429	403 030 6309	CERAMIC 68P J 50V
C1430	403 030 6309	CERAMIC 68P J 50V
C1431	403 001 1906	CERAMIC 0.01U M 16V
C1432	403 043 9601	ELECT 47U M 16V
C1441	403 001 1906	CERAMIC 0.01U M 16V
C1442	403 039 2609	ELECT 47U M 6.3V
C1443	403 042 8308	ELECT 22U M 16V
C1444	403 042 8308	ELECT 22U M 16V
C1445	403 042 8308	ELECT 22U M 16V
C1446	403 039 2609	ELECT 47U M 6.3V
C1447	403 001 1906	CERAMIC 0.01U M 16V
C1448	403 042 8308	ELECT 22U M 16V
C1449	403 042 8308	ELECT 22U M 16V
C1450	403 042 8308	ELECT 22U M 16V
C1461	403 143 2809	CERAMIC 0.047U Z 50V
C1462	403 049 0800	ELECT 1U M 50V
C1463	403 049 0800	ELECT 1U M 50V
C1464	403 049 0800	ELECT 1U M 50V
C1465	403 039 2609	ELECT 47U M 6.3V
C1466	403 001 1906	CERAMIC 0.01U M 16V
C1467	403 049 0800	ELECT 1U M 50V
C1468	403 068 9402	CERAMIC 100P K 50V
C1469	403 001 1906	CERAMIC 0.01U M 16V
C1471	403 039 2609	ELECT 47U M 6.3V
C1472	403 042 8308	ELECT 22U M 16V
C1473	403 001 1906	CERAMIC 0.01U M 16V
C1474	403 043 9601	ELECT 47U M 16V
C1475	403 121 9509	CERAMIC 0.1U Z 50V
C1476	403 068 9402	CERAMIC 100P K 50V
C1477	403 039 2609	ELECT 47U M 6.3V
C1478	403 001 1906	CERAMIC 0.01U M 16V
C1479	403 001 1906	CERAMIC 0.01U M 16V
C1480	403 001 1906	CERAMIC 0.01U M 16V
C1502	403 009 1809	CERAMIC 10P J 50V
C1512	403 039 2609	ELECT 47U M 6.3V
C1513	403 001 1906	CERAMIC 0.01U M 16V
C1514	403 011 3402	CERAMIC 120P J 50V
C1515	403 019 0403	CERAM 24P J 50V
C1521	403 001 1906	CERAMIC 0.01U M 16V
C1522	403 039 2609	ELECT 47U M 6.3V
C1523	403 042 8308	ELECT 22U M 16V
C1525	403 042 8308	ELECT 22U M 16V
C1526	403 053 9509	ELECT 4.7U M 35V

LOCATION	PARTS NO.	DESCRIPTION
C1527	403 038 2006	ELECT 100U M 6.3V
C1533	403 030 6309	CERAMIC 68P J 50V
C1534	403 030 6309	CERAMIC 68P J 50V
C1535	403 001 1906	CERAMIC 0.01U M 16V
C1536	403 001 1906	CERAMIC 0.01U M 16V
C1537	403 001 1906	CERAMIC 0.01U M 16V
C1538	403 001 1906	CERAMIC 0.01U M 16V
C1539	403 043 9601	ELECT 47U M 16V
C1540	403 001 1906	CERAMIC 0.01U M 16V
C1541	403 001 1906	CERAMIC 0.01U M 16V
C1542	403 001 1906	CERAMIC 0.01U M 16V
C1543	403 001 1906	CERAMIC 0.01U M 16V
C1544	403 001 1906	CERAMIC 0.01U M 16V
C1545	403 001 1906	CERAMIC 0.01U M 16V
C1546	403 024 1501	CERAMIC 39P J 50V
C1547	403 121 9509	CERAMIC 0.1U Z 50V
C1548	403 121 9509	CERAMIC 0.1U Z 50V
C1549	403 001 1906	CERAMIC 0.01U M 16V
C1551	403 009 1809	CERAMIC 10P J 50V
C1552	403 001 1906	CERAMIC 0.01U M 16V
C1553	403 017 9705	CERAMIC 22P J 50V
C1554	403 001 1906	CERAMIC 0.01U M 16V
C1555	403 043 9601	ELECT 47U M 16V
C1556	403 001 1906	CERAMIC 0.01U M 16V
C1557	403 039 2609	ELECT 47U M 6.3V
C1558	403 001 1906	CERAMIC 0.01U M 16V
C1559	403 001 1906	CERAMIC 0.01U M 16V
C1560	403 043 9601	ELECT 47U M 16V
C1561	403 042 9404	ELECT 22U M 16V
C1902	403 073 7004	CERAMIC 470P K 50V
C1903	403 039 2609	ELECT 47U M 6.3V
C1904	403 001 1906	CERAMIC 0.01U M 16V
C1905	403 001 1906	CERAMIC 0.01U M 16V
C1906	403 001 1906	CERAMIC 0.01U M 16V
C1907	403 001 1906	CERAMIC 0.01U M 16V
C1908	403 001 1906	CERAMIC 0.01U M 16V
C1909	403 024 1501	CERAMIC 39P J 50V
C1910	403 001 1906	CERAMIC 0.01U M 16V
C1911	403 043 9601	ELECT 47U M 16V
C1912	403 001 1906	CERAMIC 0.01U M 16V
C1913	403 039 2609	ELECT 47U M 6.3V
C1914	403 001 1906	CERAMIC 0.01U M 16V
C1915	403 001 1906	CERAMIC 0.01U M 16V
C1916	403 001 1906	CERAMIC 0.01U M 16V
C1917	403 001 1906	CERAMIC 0.01U M 16V
C1918	403 001 1906	CERAMIC 0.01U M 16V
C1919	403 001 1906	CERAMIC 0.01U M 16V
C1920	403 010 7807	CERAMIC 12P J 50V
C1931	403 042 8308	ELECT 22U M 16V
C1932	403 043 9601	ELECT 47U M 16V
C1933	403 001 1906	CERAMIC 0.01U M 16V
C1934	403 042 8308	ELECT 22U M 16V
C1935	403 042 8308	ELECT 22U M 16V
C1937	403 042 8308	ELECT 22U M 16V
C1938	403 121 9509	CERAMIC 0.1U Z 50V
C1939	403 042 8308	ELECT 22U M 16V
C1940	403 039 2609	ELECT 47U M 6.3V
D1403	407 012 4406	DIODE 1SS133-T-77
D1422	407 012 4406	DIODE 1SS133-T-77
D1423	407 012 4406	DIODE 1SS133-T-77
D1441	407 012 4406	DIODE 1SS133-T-77
D1442	407 012 4406	DIODE 1SS133-T-77
D1443	407 012 4406	DIODE 1SS133-T-77
D1444	407 012 4406	DIODE 1SS133-T-77
D1445	407 012 4406	DIODE 1SS133-T-77
D1446	407 012 4406	DIODE 1SS133-T-77
D1447	407 012 4406	DIODE 1SS133-T-77
D1448	407 012 4406	DIODE 1SS133-T-77

LOCATION	PARTS NO.	DESCRIPTION
D1449	407 012 4406	DIODE 1SS133
D1451	407 012 4406	DIODE 1SS133-T-77
D1452	407 012 4406	DIODE 1SS133-T-77
D1461	407 004 9709	DIODE DSK10C-BT
D1501	407 012 4406	DIODE 1SS133-T-77
D1502	407 004 9709	DIODE DSK10C-BT
D1503	407 012 4406	DIODE 1SS133-T-77
D1540	407 012 4406	DIODE 1SS133-T-77
D1541	407 012 4406	DIODE 1SS133-T-77
D1542	407 012 4406	DIODE 1SS133-T-77
D1544	407 012 4406	DIODE 1SS133-T-77
D1547	407 012 4406	DIODE 1SS133-T-77
D1551	407 012 4406	DIODE 1SS133-T-77
D1553	407 012 4406	DIODE 1SS133
D1902	407 012 4406	DIODE 1SS133-T-77
D1903	407 012 4406	DIODE 1SS133-T-77
D1904	407 012 4406	DIODE 1SS133-T-77
D1905	407 004 9709	DIODE DSK10C-BT
DL141	613 088 0833	DELAY,2H
DL142	613 088 0840	DELAY,2H
IC141	409 067 7203	IC L5431-AA
IC142	409 168 8109	IC NJM2235S
IC143	409 168 8000	IC NJM2234S
IC144	409 172 6801	IC BA7604N
IC145	409 168 8307	IC BA7607
IC146	409 168 8208	IC NJM2245S
IC147	409 132 0306	IC LA7327
IC148	409 168 8109	IC NJM2235S
IC149	409 050 7807	IC TC4001BP
IC150	409 050 7807	IC TC4001BP
IC192	409 168 8109	IC NJM2235S
IC193	409 168 8406	IC BA7605N
L1421	613 015 6730	HF CHOKE 100UH K
L1422	613 015 6730	HF CHOKE 100UH K
L1441	613 015 6730	HF CHOKE 100UH K
L1442	613 015 6730	HF CHOKE 100UH K
L1461	613 015 6730	HF CHOKE 100UH K
L1462	613 015 6730	HF CHOKE 100UH K
L1463	613 015 6730	HF CHOKE 100UH K
L1504	613 015 6730	HF CHOKE 100UH K
L1508	613 015 6730	HF CHOKE 100UH K
L1541	613 014 1101	HF CHOKE 15UH J
L1542	613 014 1101	HF CHOKE 15UH J
L1543	613 015 6730	HF CHOKE 100UH K
L1901	613 015 6730	HF CHOKE 100UH K
L1902	613 090 6458	COIL,CHOKE 15UH
L1903	613 014 1101	HF CHOKE 15UH J
L1904	613 015 6730	HF CHOKE 100UH K
L1905	613 015 6730	HF CHOKE 100UH K
L1906	613 014 1224	HF CHOKE 150UH J
L1931	613 015 6730	HF CHOKE 100UH K
Q1401	405 043 6000	TR 2SC3807
Q1402	405 016 9601	TR 2SC3070-AE
Q1403	405 006 6504	TR 2SA984-E-AA
OR	405 006 6702	TR 2SA984-F-AA
Q1405	405 084 8100	TR 2SC2960-E-SPA-AC
OR	405 084 8209	TR 2SC2960-F-SPA-AC
OR	405 084 8308	TR 2SC2960-G-SPA-AC
Q1406	405 009 7003	TR 2SB985-T-AE
OR	405 009 6907	TR 2SB985-S-AE
Q1407	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1408	405 006 6504	TR 2SA984-E-AA

LOCATION	PARTS NO.	DESCRIPTION
Q1408	405 006 6702	TR 2SA984-F-AA
Q1410	405 006 6504	TR 2SA984-E-AA
OR	405 006 6702	TR 2SA984-F-AA
Q1421	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1422	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1423	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1424	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1441	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1442	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1443	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
Q1462	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1463	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1464	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1466	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1467	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1468	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1469	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1502	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 011 8401	TR 2SC1740S-DCTP-Q
Q1503	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1504	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1539	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1540	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1541	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1542	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC

LOCATION	PARTS NO.	DESCRIPTION
Q1542	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1543	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1544	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1545	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1546	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1547	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1548	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1549	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1550	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1551	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1552	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1553	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1901	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1902	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1903	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1904	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1905	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1906	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1907	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1908	405 004 4007	TR 2SA608-E-SPA-AC

LOCATION	PARTS NO.	DESCRIPTION
Q1908	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1931	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1932	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1933	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1935	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1936	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1950	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
R1401	401 020 0702	CARBON 470 JA 1/4W
R1402	401 020 2805	CARBON 47K JA 1/4W
R1403	401 020 2805	CARBON 47K JA 1/4W
R1404	401 012 6903	CARBON 10K JA 1/4W
R1406	401 020 2805	CARBON 47K JA 1/4W
R1407	401 018 5702	CARBON 330K JA 1/4W
R1408	401 017 1705	CARBON 2.7K JA 1/4W
R1409	401 020 1907	CARBON 4.7K JA 1/4W
R1410	401 018 3708	CARBON 3.3K JA 1/4W
R1411	401 018 3708	CARBON 3.3K JA 1/4W
R1412	401 016 2505	CARBON 220 JA 1/4W
R1413	401 016 2505	CARBON 220 JA 1/4W
R1416	401 017 1705	CARBON 2.7K JA 1/4W
R1417	401 020 1907	CARBON 4.7K JA 1/4W
R1418	401 020 1907	CARBON 4.7K JA 1/4W
R1419	401 021 2903	CARBON 5.6K JA 1/4W
R1421	401 020 2805	CARBON 47K JA 1/4W
R1422	401 016 4707	CARBON 22K JA 1/4W
R1423	401 022 1806	CARBON 680 JA 1/4W
R1424	401 023 6909	CARBON 910 JA 1/4W
R1425	401 012 5609	CARBON 1K JA 1/4W
R1426	401 012 5609	CARBON 1K JA 1/4W
R1427	401 022 1806	CARBON 680 JA 1/4W
R1428	401 020 2805	CARBON 47K JA 1/4W
R1429	401 022 1806	CARBON 680 JA 1/4W
R1430	401 020 2805	CARBON 47K JA 1/4W
R1431	401 016 4707	CARBON 22K JA 1/4W
R1432	401 016 3700	CARBON 2.2K JA 1/4W
R1433	401 020 1907	CARBON 4.7K JA 1/4W
R1434	401 012 6903	CARBON 10K JA 1/4W
R1435	401 012 6903	CARBON 10K JA 1/4W
R1437	401 016 3700	CARBON 2.2K JA 1/4W
R1438	401 012 6903	CARBON 10K JA 1/4W
R1439	401 012 6903	CARBON 10K JA 1/4W
R1442	401 016 3700	CARBON 2.2K JA 1/4W
R1443	401 012 5609	CARBON 1K JA 1/4W
R1444	401 012 5609	CARBON 1K JA 1/4W
R1445	401 020 2805	CARBON 47K JA 1/4W
R1446	401 020 2805	CARBON 47K JA 1/4W
R1447	401 012 5609	CARBON 1K JA 1/4W
R1448	401 020 1907	CARBON 4.7K JA 1/4W
R1449	401 020 2805	CARBON 47K JA 1/4W
R1450	401 020 2805	CARBON 47K JA 1/4W
R1451	401 020 1907	CARBON 4.7K JA 1/4W
R1452	401 023 1607	CARBON 820 JA 1/4W
R1453	401 012 4404	CARBON 100 JA 1/4W
R1454	401 022 0700	CARBON 68 JA 1/4W
R1461	401 018 3708	CARBON 3.3K JA 1/4W
R1467	401 016 4707	CARBON 22K JA 1/4W
R1468	401 012 5609	CARBON 1K JA 1/4W
R1469	401 012 5609	CARBON 1K JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R1470	401 012 5609	CARBON 1K JA 1/4W
R1471	401 012 5609	CARBON 1K JA 1/4W
R1472	401 012 5609	CARBON 1K JA 1/4W
R1473	401 012 4404	CARBON 100 JA 1/4W
R1474	401 020 0702	CARBON 470 JA 1/4W
R1475	401 013 5202	CARBON 1.2K JA 1/4W
R1476	401 012 5609	CARBON 1K JA 1/4W
R1477	401 020 2805	CARBON 47K JA 1/4W
R1479	401 016 3700	CARBON 2.2K JA 1/4W
R1480	401 016 3700	CARBON 2.2K JA 1/4W
R1481	401 105 3701	CARBON 18K JA 1/4W
R1482	401 012 5609	CARBON 1K JA 1/4W
R1483	401 015 9406	CARBON 2K JA 1/4W
R1484	401 016 3700	CARBON 2.2K JA 1/4W
R1485	401 012 5609	CARBON 1K JA 1/4W
R1486	401 020 2805	CARBON 47K JA 1/4W
R1487	401 016 3700	CARBON 2.2K JA 1/4W
R1488	401 012 5609	CARBON 1K JA 1/4W
R1491	401 012 9201	CARBON 1M JA 1/4W
R1492	401 012 9201	CARBON 1M JA 1/4W
R1493	401 012 9201	CARBON 1M JA 1/4W
R1494	401 012 9201	CARBON 1M JA 1/4W
R1495	401 013 5202	CARBON 1.2K JA 1/4W
R1496	401 012 6903	CARBON 10K JA 1/4W
R1497	401 013 5202	CARBON 1.2K JA 1/4W
R1498	401 012 5609	CARBON 1K JA 1/4W
R1499	401 016 4707	CARBON 22K JA 1/4W
R1508	401 022 3008	CARBON 6.8K JA 1/4W
R1509	401 020 1907	CARBON 4.7K JA 1/4W
R1510	401 016 3700	CARBON 2.2K JA 1/4W
R1511	401 012 5609	CARBON 1K JA 1/4W
R1512	401 022 1806	CARBON 680 JA 1/4W
R1519	401 012 5609	CARBON 1K JA 1/4W
R1520	401 013 5202	CARBON 1.2K JA 1/4W
R1521	401 015 9406	CARBON 2K JA 1/4W
R1525	401 012 5609	CARBON 1K JA 1/4W
R1527	401 018 3708	CARBON 3.3K JA 1/4W
R1528	401 012 9201	CARBON 1M JA 1/4W
R1529	401 012 9201	CARBON 1M JA 1/4W
R1530	401 012 9201	CARBON 1M JA 1/4W
R1531	401 012 9201	CARBON 1M JA 1/4W
R1532	401 012 5609	CARBON 1K JA 1/4W
R1533	401 012 6903	CARBON 10K JA 1/4W
R1534	401 016 4707	CARBON 22K JA 1/4W
R1535	401 020 2805	CARBON 47K JA 1/4W
R1536	401 022 1806	CARBON 680 JA 1/4W
R1537	401 016 3700	CARBON 2.2K JA 1/4W
R1538	401 016 4707	CARBON 22K JA 1/4W
R1539	401 020 1907	CARBON 4.7K JA 1/4W
R1540	401 012 5609	CARBON 1K JA 1/4W
R1541	401 013 5202	CARBON 1.2K JA 1/4W
R1542	401 012 5609	CARBON 1K JA 1/4W
R1543	401 022 4005	CARBON 68K JA 1/4W
R1544	401 016 4707	CARBON 22K JA 1/4W
R1545	401 014 4006	CARBON 1.5K JA 1/4W
R1546	401 022 1806	CARBON 680 JA 1/4W
R1547	401 015 1509	CARBON 180 JA 1/4W
R1548	401 012 6903	CARBON 10K JA 1/4W
R1549	401 012 6903	CARBON 10K JA 1/4W
R1550	401 012 4404	CARBON 100 JA 1/4W
R1551	401 017 0708	CARBON 270 JA 1/4W
R1552	401 017 0708	CARBON 270 JA 1/4W
R1553	401 018 2701	CARBON 330 JA 1/4W
R1554	401 020 2805	CARBON 47K JA 1/4W
R1555	401 016 4707	CARBON 22K JA 1/4W
R1556	401 012 5609	CARBON 1K JA 1/4W
R1557	401 012 5609	CARBON 1K JA 1/4W
R1558	401 022 1806	CARBON 680 JA 1/4W
R1559	401 020 1907	CARBON 4.7K JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R1560	401 012 5609	CARBON 1K JA 1/4W
R1561	401 023 1607	CARBON 820 JA 1/4W
R1562	401 020 2805	CARBON 47K JA 1/4W
R1563	401 016 4707	CARBON 22K JA 1/4W
R1564	401 022 1806	CARBON 680 JA 1/4W
R1565	401 012 5609	CARBON 1K JA 1/4W
R1566	401 012 5609	CARBON 1K JA 1/4W
R1567	401 012 5609	CARBON 1K JA 1/4W
R1568	401 022 1806	CARBON 680 JA 1/4W
R1569	401 018 4804	CARBON 33K JA 1/4W
R1570	401 022 1806	CARBON 680 JA 1/4W
R1571	401 021 1807	CARBON 560 JA 1/4W
R1572	401 022 1806	CARBON 680 JA 1/4W
R1573	401 016 3700	CARBON 2.2K JA 1/4W
R1574	401 012 5609	CARBON 1K JA 1/4W
R1575	401 012 5609	CARBON 1K JA 1/4W
R1576	401 012 5609	CARBON 1K JA 1/4W
R1577	401 020 2805	CARBON 47K JA 1/4W
R1578	401 018 4804	CARBON 33K JA 1/4W
R1579	401 022 0700	CARBON 68 JA 1/4W
R1581	401 012 6903	CARBON 10K JA 1/4W
R1582	401 012 6903	CARBON 10K JA 1/4W
R1585	401 020 2805	CARBON 47K JA 1/4W
R1586	401 020 2805	CARBON 47K JA 1/4W
R1587	401 020 2805	CARBON 47K JA 1/4W
R1588	401 012 6903	CARBON 10K JA 1/4W
R1589	401 012 6903	CARBON 10K JA 1/4W
R1590	401 016 4707	CARBON 22K JA 1/4W
R1901	401 021 2903	CARBON 5.6K JA 1/4W
R1902	401 013 6308	CARBON 12K JA 1/4W
R1903	401 012 5609	CARBON 1K JA 1/4W
R1904	401 012 5609	CARBON 1K JA 1/4W
R1905	401 022 1806	CARBON 680 JA 1/4W
R1906	401 019 0904	CARBON 390 JA 1/4W
R1907	401 022 6702	CARBON 75 JA 1/4W
R1908	401 016 2505	CARBON 220 JA 1/4W
R1909	401 017 0708	CARBON 270 JA 1/4W
R1910	401 018 3708	CARBON 3.3K JA 1/4W
R1911	401 018 3708	CARBON 3.3K JA 1/4W
R1912	401 012 5609	CARBON 1K JA 1/4W
R1913	401 013 5202	CARBON 1.2K JA 1/4W
R1914	401 020 2805	CARBON 47K JA 1/4W
R1915	401 016 4707	CARBON 22K JA 1/4W
R1916	401 012 5609	CARBON 1K JA 1/4W
R1917	401 016 3700	CARBON 2.2K JA 1/4W
R1918	401 012 5609	CARBON 1K JA 1/4W
R1919	401 014 4006	CARBON 1.5K JA 1/4W
R1920	401 012 5609	CARBON 1K JA 1/4W
R1921	401 016 3700	CARBON 2.2K JA 1/4W
R1922	401 016 3700	CARBON 2.2K JA 1/4W
R1923	401 012 5609	CARBON 1K JA 1/4W
R1924	401 012 5609	CARBON 1K JA 1/4W
R1925	401 013 5202	CARBON 1.2K JA 1/4W
R1926	401 013 5202	CARBON 1.2K JA 1/4W
R1927	401 012 5609	CARBON 1K JA 1/4W
R1928	401 012 5609	CARBON 1K JA 1/4W
R1930	401 015 1509	CARBON 180 JA 1/4W
R1931	401 012 5609	CARBON 1K JA 1/4W
R1932	401 012 5609	CARBON 1K JA 1/4W
R1933	401 013 5202	CARBON 1.2K JA 1/4W
R1934	401 016 3700	CARBON 2.2K JA 1/4W
R1935	401 020 2805	CARBON 47K JA 1/4W
R1936	401 012 5609	CARBON 1K JA 1/4W
R1937	401 020 0702	CARBON 470 JA 1/4W
R1938	401 015 9406	CARBON 2K JA 1/4W
R1939	401 022 1806	CARBON 680 JA 1/4W
R1940	401 105 3701	CARBON 18K JA 1/4W
R1941	401 016 3700	CARBON 2.2K JA 1/4W
R1942	401 022 1806	CARBON 680 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R1943	401 012 5609	CARBON 1K JA 1/4W
R1944	401 020 2805	CARBON 47K JA 1/4W
R1945	401 023 1607	CARBON 820 JA 1/4W
R1946	401 012 6903	CARBON 10K JA 1/4W
R1950	401 018 3708	CARBON 3.3K JA 1/4W
R1951	401 016 4707	CARBON 22K JA 1/4W
R1952	401 016 4707	CARBON 22K JA 1/4W
R1953	401 016 3700	CARBON 2.2K JA 1/4W
R1954	401 014 4006	CARBON 1.5K JA 1/4W
R1955	401 015 2605	CARBON 1.8K JA 1/4W
VR141	613 001 9059	SEMI VR 22KB
OR	613 001 9424	SEMI VR 20KB
VR153	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
VR154	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
VR155	613 001 8977	SEMI VR 1KB
OR	613 001 9370	SEMI VR 1KB
VR156	613 001 9387	SEMI VR 2KB
OR	613 001 8991	SEMI VR 2.2KB
VR157	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
VR191	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
VR192	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
X1401	613 088 0819	FILTER,4.43MHZ B.P.F
X1402	613 088 0789	FILTER,6MHZ L.P.F
X1404	613 088 0819	FILTER,4.43MHZ B.P.F
X1405	613 088 0819	FILTER,4.43MHZ B.P.F
X1501	613 088 0871	OSC,CRYSTAL 13.3MHZ

COMPL,VD-1

COMPL.NO.	613 088 1083	
B1001	405 018 2501	TR 2SC3399-AC
B1002	405 018 2501	TR 2SC3399-AC
B1003	405 018 2501	TR 2SC3399-AC
B1005	405 018 2501	TR 2SC3399-AC
B1006	405 018 2808	TR 2SC3402-AC
B1120	405 018 2501	TR 2SC3399-AC
B1121	405 018 2501	TR 2SC3399-AC
B1140	405 018 2501	TR 2SC3399-AC
B1142	405 018 2501	TR 2SC3399-AC
B1180	405 018 2501	TR 2SC3399-AC
B1181	405 018 2501	TR 2SC3399-AC
B1182	405 003 7900	TR 2SA1348-AC
B1183	405 003 7603	TR 2SA1345-AC
B1201	405 018 2501	TR 2SC3399-AC
B1202	405 018 2501	TR 2SC3399-AC
B1203	405 018 2501	TR 2SC3399-AC
B1240	405 018 2501	TR 2SC3399-AC
B1301	405 018 2501	TR 2SC3399-AC
B1340	405 018 2501	TR 2SC3399-AC
B1375	405 018 2501	TR 2SC3399-AC
B1376	405 018 2501	TR 2SC3399-AC
B1378	405 018 2501	TR 2SC3399-AC
B1379	405 018 2501	TR 2SC3399-AC
B1960	405 018 2501	TR 2SC3399-AC
B1961	405 003 7900	TR 2SA1348-AC
B1962	405 003 7603	TR 2SA1345-AC
B1963	405 018 2501	TR 2SC3399-AC
C1001	403 062 4502	POLYESTER 5600P J 50V
C1003	403 143 2809	CERAMIC 0.047U Z 50V
C1004	403 001 1906	CERAMIC 0.01U M 16V
C1005	403 001 1906	CERAMIC 0.01U M 16V

LOCATION	PARTS NO.	DESCRIPTION		
C1006	403 001 1906	CERAMIC	0.01U M	16V
C1007	403 001 1906	CERAMIC	0.01U M	16V
C1008	403 001 1906	CERAMIC	0.01U M	16V
C1009	403 073 3204	CERAMIC	390P K	50V
C1010	403 001 1906	CERAMIC	0.01U M	16V
C1011	403 017 9705	CERAMIC	22P J	50V
C1012	403 026 2209	CERAMIC	47P J	50V
C1013	403 053 9509	ELECT	4.7U M	35V
C1014	403 001 1906	CERAMIC	0.01U M	16V
C1015	403 039 2609	ELECT	47U M	6.3V
C1016	403 001 1906	CERAMIC	0.01U M	16V
C1017	403 050 0509	ELECT	2.2U M	50V
C1018	403 118 0106	NP-ELECT	10U M	16V
C1019	403 050 7003	ELECT	3.3U M	50V
C1020	403 050 0509	ELECT	2.2U M	50V
C1021	403 070 7205	CERAMIC	150P J	50V
C1022	403 063 2200	POLYESTER	0.068U K	50V
C1023	403 041 9405	ELECT	10U M	16V
C1024	403 026 2209	CERAMIC	47P J	50V
C1035	403 039 2609	ELECT	47U M	6.3V
C1036	403 001 1906	CERAMIC	0.01U M	16V
C1037	403 042 8308	ELECT	22U M	16V
C1038	403 073 2702	CERAMIC	390P J	50V
C1039	403 073 2702	CERAMIC	390P J	50V
C1041	403 042 8308	ELECT	22U M	16V
C1043	403 075 3103	CERAMIC	82P J	50V
C1044	403 042 8308	ELECT	22U M	16V
C1046	403 075 4001	CERAMIC	820P J	50V
C1047	403 075 3103	CERAMIC	82P J	50V
C1048	403 070 3702	CERAMIC	120P J	50V
C1049	403 041 2703	ELECT	47U M	10V
C1050	403 001 1906	CERAMIC	0.01U M	16V
C1051	403 039 2609	ELECT	47U M	6.3V
C1052	403 041 9405	ELECT	10U M	16V
C1053	403 041 9405	ELECT	10U M	16V
C1061	403 070 7205	CERAMIC	150P J	50V
C1062	403 022 7703	CERAMIC	33P J	50V
C1063	403 025 7007	CERAMIC	4.7P D	50V
C1064	403 022 7703	CERAMIC	33P J	50V
C1070	403 074 9205	CERAMIC	680P K	50V
C1071	403 001 1906	CERAMIC	0.01U M	16V
C1072	403 041 2703	ELECT	47U M	10V
C1073	403 039 2609	ELECT	47U M	6.3V
C1074	403 001 1906	CERAMIC	0.01U M	16V
C1075	403 009 1809	CERAMIC	10P J	50V
C1076	403 024 1501	CERAMIC	39P J	50V
C1077	403 024 1501	CERAMIC	39P J	50V
C1078	403 009 1809	CERAMIC	10P J	50V
C1080	403 053 9509	ELECT	4.7U M	35V
C1081	403 053 9509	ELECT	4.7U M	35V
C1082	403 053 9509	ELECT	4.7U M	35V
C1083	403 001 1906	CERAMIC	0.01U M	16V
C1084	403 001 1906	CERAMIC	0.01U M	16V
C1085	403 143 2809	CERAMIC	0.047U Z	50V
C1086	403 143 2809	CERAMIC	0.047U Z	50V
C1091	403 039 2609	ELECT	47U M	6.3V
C1092	403 001 1906	CERAMIC	0.01U M	16V
C1093	403 040 2209	ELECT	22U M	10V
C1094	403 001 1906	CERAMIC	0.01U M	16V
C1095	403 053 9509	ELECT	4.7U M	35V
C1096	403 053 9509	ELECT	4.7U M	35V
C1097	403 053 9509	ELECT	4.7U M	35V
C1098	403 043 9601	ELECT	47U M	16V
C1099	403 053 9509	ELECT	4.7U M	35V
C1101	403 001 1906	CERAMIC	0.01U M	16V
C1104	403 014 2600	CERAMIC	18P J	50V
C1106	403 041 9405	ELECT	10U M	16V
C1107	403 041 9405	ELECT	10U M	16V
C1108	403 039 2609	ELECT	47U M	6.3V
C1109	403 001 1906	CERAMIC	0.01U M	16V
C1110	403 014 2600	CERAMIC	18P J	50V
C1112	403 024 1501	CERAMIC	39P J	50V
C1113	403 012 6006	CERAMIC	15P J	50V
C1114	403 068 8801	CERAMIC	100P J	50V
C1120	403 038 5403	ELECT	22U M	6.3V
C1121	403 053 9509	ELECT	4.7U M	35V
C1122	403 053 9509	ELECT	4.7U M	35V
C1124	403 042 8308	ELECT	22U M	16V
C1125	403 039 2609	ELECT	47U M	6.3V
C1126	403 001 1906	CERAMIC	0.01U M	16V
C1127	403 001 1906	CERAMIC	0.01U M	16V
C1128	403 144 4505	CERAMIC	270P G	50V
C1129	403 144 4505	CERAMIC	270P G	50V
C1130	403 144 4406	CERAMIC	220P G	50V
C1131	403 144 4307	CERAMIC	82P G	50V
C1132	403 144 4505	CERAMIC	270P G	50V
C1133	403 071 5408	CERAMIC	220P J	50V
C1134	403 072 4202	CERAMIC	270P J	50V
C1135	403 075 3103	CERAMIC	82P J	50V
C1136	403 072 4202	CERAMIC	270P J	50V
C1140	403 001 1906	CERAMIC	0.01U M	16V
C1141	403 001 1906	CERAMIC	0.01U M	16V
C1142	403 047 9003	ELECT	0.1U M	50V
C1144	403 047 9003	ELECT	0.1U M	50V
C1145	403 072 7500	CERAMIC	330P J	50V
C1146	403 001 1906	CERAMIC	0.01U M	16V
C1147	403 049 0800	ELECT	1U M	50V
C1148	403 001 1906	CERAMIC	0.01U M	16V
C1149	403 039 2609	ELECT	47U M	6.3V
C1150	403 144 5403	CERAMIC	120P G	50V
C1151	403 001 1906	CERAMIC	0.01U M	16V
C1152	403 023 9607	CERAMIC	39P J	50V
C1154	403 001 1906	CERAMIC	0.01U M	16V
C1155	403 001 1906	CERAMIC	0.01U M	16V
C1156	403 028 3402	CERAMIC	56P J	50V
C1165	403 001 1906	CERAMIC	0.01U M	16V
C1166	403 041 2703	ELECT	47U M	10V
C1167	403 074 8703	CERAMIC	680P J	50V
C1169	403 024 1501	CERAMIC	39P J	50V
C1170	403 026 2209	CERAMIC	47P J	50V
C1171	403 010 7807	CERAMIC	12P J	50V
C1173	403 039 2609	ELECT	47U M	6.3V
C1174	403 001 1906	CERAMIC	0.01U M	16V
C1175	403 053 9509	ELECT	4.7U M	35V
C1176	403 053 9509	ELECT	4.7U M	35V
C1177	403 001 1906	CERAMIC	0.01U M	16V
C1178	403 001 1906	CERAMIC	0.01U M	16V
C1179	403 053 9509	ELECT	4.7U M	35V
C1180	403 001 1906	CERAMIC	0.01U M	16V
C1181	403 049 0800	ELECT	1U M	50V
C1182	403 049 0800	ELECT	1U M	50V
C1183	403 001 1906	CERAMIC	0.01U M	16V
C1185	403 041 9405	ELECT	10U M	16V
C1186	403 001 1906	CERAMIC	0.01U M	16V
C1187	403 039 2609	ELECT	47U M	6.3V
C1189	403 038 9005	ELECT	33U M	6.3V
C1190	403 041 9405	ELECT	10U M	16V
C1191	403 001 1906	CERAMIC	0.01U M	16V
C1201	403 001 1906	CERAMIC	0.01U M	16V
C1202	403 028 3402	CERAMIC	56P J	50V
C1204	403 017 9705	CERAMIC	22P J	50V
C1205	403 039 2609	ELECT	47U M	6.3V
C1207	403 028 3402	CERAMIC	56P J	50V
C1208	403 030 6309	CERAMIC	68P J	50V
C1209	403 074 8703	CERAMIC	680P J	50V
C1212	403 169 2906	CERAMIC	8.2P D	50V
C1214	403 001 1906	CERAMIC	0.01U M	16V
C1216	403 028 3402	CERAMIC	56P J	50V

LOCATION	PARTS NO.	DESCRIPTION
C1241	403 022 7703	CERAMIC 33P J 50V
C1243	403 073 6205	CERAMIC 470P J 50V
C1244	403 019 9703	CERAMIC 27P J 50V
C1245	403 001 1906	CERAMIC 0.01U M 16V
C1246	403 001 1906	CERAMIC 0.01U M 16V
C1247	403 039 2609	ELECT 47U M 6.3V
C1248	403 001 1906	CERAMIC 0.01U M 16V
C1251	403 039 2609	ELECT 47U M 6.3V
C1252	403 001 1906	CERAMIC 0.01U M 16V
C1253	403 001 1906	CERAMIC 0.01U M 16V
C1254	403 001 1906	CERAMIC 0.01U M 16V
C1255	403 001 1906	CERAMIC 0.01U M 16V
C1256	403 001 1906	CERAMIC 0.01U M 16V
C1257	403 001 1906	CERAMIC 0.01U M 16V
C1258	403 001 1906	CERAMIC 0.01U M 16V
C1259	403 001 1906	CERAMIC 0.01U M 16V
C1260	403 169 2906	CERAMIC 8.2P D 50V
C1262	403 038 2006	ELECT 100U M 6.3V
C1263	403 038 6707	ELECT 220U M 6.3V
C1265	403 001 1906	CERAMIC 0.01U M 16V
C1271	403 039 2609	ELECT 47U M 6.3V
C1272	403 001 1906	CERAMIC 0.01U M 16V
C1279	403 001 1906	CERAMIC 0.01U M 16V
C1280	403 001 1906	CERAMIC 0.01U M 16V
C1281	403 001 1906	CERAMIC 0.01U M 16V
C1288	403 001 1906	CERAMIC 0.01U M 16V
C1290	403 041 2802	ELECT 47U M 10V
C1291	403 001 1906	CERAMIC 0.01U M 16V
C1292	403 001 1906	CERAMIC 0.01U M 16V
C1293	403 169 2906	CERAMIC 8.2P D 50V
C1294	403 024 1501	CERAMIC 39P J 50V
C1295	403 001 1906	CERAMIC 0.01U M 16V
C1296	403 169 2906	CERAMIC 8.2P D 50V
C1301	403 041 9405	ELECT 10U M 16V
C1302	403 121 9509	CERAMIC 0.1U Z 50V
C1303	403 004 1002	CERAMIC 0.047U M 25V
C1304	403 028 1002	CERAMIC 510P J 50V
C1305	403 028 1002	CERAMIC 510P J 50V
C1306	403 041 2703	ELECT 47U M 10V
C1307	403 001 1906	CERAMIC 0.01U M 16V
C1308	403 018 6109	CERAMIC 220P J 50V
C1309	403 030 5005	CERAMIC 68P J 50V
C1310	403 001 1906	CERAMIC 0.01U M 16V
C1311	403 039 2609	ELECT 47U M 6.3V
C1312	403 075 3103	CERAMIC 82P J 50V
C1314	403 041 9405	ELECT 10U M 16V
C1329	403 001 1906	CERAMIC 0.01U M 16V
C1340	403 027 9405	CERAMIC 51P J 50V
C1341	403 001 7007	CERAMIC 3900P K 16V
C1342	403 049 0800	ELECT 1U M 50V
C1343	403 001 1906	CERAMIC 0.01U M 16V
C1344	403 059 6007	POLYESTER 0.022U K 50V
C1345	403 049 0800	ELECT 1U M 50V
C1346	403 023 9607	CERAMIC 39P J 50V
C1347	403 039 2609	ELECT 47U M 6.3V
C1348	403 001 1906	CERAMIC 0.01U M 16V
C1349	403 027 9405	CERAMIC 51P J 50V
C1350	403 001 1906	CERAMIC 0.01U M 16V
C1353	403 017 4304	CERAMIC 200P J 50V
C1354	403 049 0800	ELECT 1U M 50V
C1355	403 049 0800	ELECT 1U M 50V
C1356	403 001 1906	CERAMIC 0.01U M 16V
C1357	403 039 2609	ELECT 47U M 6.3V
C1358	403 001 1906	CERAMIC 0.01U M 16V
C1360	403 001 1906	CERAMIC 0.01U M 16V
C1362	403 059 6007	POLYESTER 0.022U K 50V
C1363	403 049 0800	ELECT 1U M 50V
C1364	403 001 1906	CERAMIC 0.01U M 16V
C1365	403 001 1906	CERAMIC 0.01U M 16V
C1366	403 049 0800	ELECT 1U M 50V
C1367	403 001 1906	CERAMIC 0.01U M 16V
C1368	403 030 6309	CERAMIC 68P J 50V
C1375	403 068 9402	CERAMIC 100P K 50V
C1376	403 001 1906	CERAMIC 0.01U M 16V
C1377	403 001 1906	CERAMIC 0.01U M 16V
C1378	403 070 7205	CERAMIC 150P J 50V
C1379	403 070 7205	CERAMIC 150P J 50V
C1380	403 001 1906	CERAMIC 0.01U M 16V
C1381	403 001 1906	CERAMIC 0.01U M 16V
C1382	403 121 9509	CERAMIC 0.1U Z 50V
C1383	403 001 1906	CERAMIC 0.01U M 16V
C1390	403 001 1906	CERAMIC 0.01U M 16V
C1391	403 070 7205	CERAMIC 150P J 50V
C1392	403 071 6207	CERAMIC 220P K 50V
C1394	403 001 1906	CERAMIC 0.01U M 16V
C1395	403 001 6109	CERAMIC 2700P K 16V
C1960	403 001 1906	CERAMIC 0.01U M 16V
C1961	403 121 9509	CERAMIC 0.1U Z 50V
C1962	403 121 9509	CERAMIC 0.1U Z 50V
C1963	403 001 1906	CERAMIC 0.01U M 16V
C1964	403 001 1906	CERAMIC 0.01U M 16V
C1987	403 001 1906	CERAMIC 0.01U M 16V
C2601	403 041 9603	ELECT 10U M 16V
C2602	403 068 9402	CERAMIC 100P K 50V
C2603	403 068 9402	CERAMIC 100P K 50V
C2604	403 041 9603	ELECT 10U M 16V
C2605	403 041 9603	ELECT 10U M 16V
C2606	403 043 9700	ELECT 47U M 16V
C2607	403 039 2708	ELECT 47U M 6.3V
C2609	403 001 4303	CERAMIC 1800P K 16V
D1002	407 012 4406	DIODE 1SS133-T-77
D1003	407 012 4406	DIODE 1SS133-T-77
D1004	407 012 4406	DIODE 1SS133-T-77
D1005	407 012 4406	DIODE 1SS133-T-77
D1006	407 012 4406	DIODE 1SS133-T-77
D1007	407 012 4406	DIODE 1SS133-T-77
D1008	407 012 4406	DIODE 1SS133-T-77
D1009	407 012 4406	DIODE 1SS133-T-77
D1120	407 012 4406	DIODE 1SS133-T-77
D1121	407 012 4406	DIODE 1SS133-T-77
D1140	407 012 4406	DIODE 1SS133-T-77
D1141	407 012 4406	DIODE 1SS133-T-77
D1165	407 012 4406	DIODE 1SS133
D1180	407 012 4406	DIODE 1SS133-T-77
D1182	407 012 4406	DIODE 1SS133-T-77
D1183	407 012 4406	DIODE 1SS133-T-77
D1184	407 012 4406	DIODE 1SS133-T-77
D1186	407 012 4406	DIODE 1SS133-T-77
D1301	407 012 4406	DIODE 1SS133-T-77
D1340	407 004 9709	DIODE DSK10C-BT
D1341	407 012 4406	DIODE 1SS133-T-77
D1342	407 012 4406	DIODE 1SS133-T-77
D1375	407 012 4406	DIODE 1SS133-T-77
D1376	407 012 4406	DIODE 1SS133-T-77
D1961	407 012 4406	DIODE 1SS133
DL123	613 088 0826	DELAY,2H
IC101	409 157 9803	IC BA7281
IC102	409 173 5605	IC NJM2246S
IC103	409 168 8505	IC MSM6967-RS
IC104	409 148 9904	IC M5278L09
IC105	409 173 5605	IC NJM2246S
IC106	409 131 2202	IC VC-2031DP
IC108	409 000 7505	IC AN3215K
IC109	409 168 8505	IC MSM6967-RS
IC110	409 074 3502	IC LA7311

LOCATION	PARTS NO.	DESCRIPTION
IC111	409 168 8406	IC BA7605N
IC121	409 172 6801	IC BA7604N
IC122	409 168 8000	IC NJM2234S
IC123	409 001 2400	IC AN6367K
IC124	409 162 4602	IC TA7357P
IC125	409 051 6700	IC TC4538BP
IC127	409 074 5803	IC TA8632N
IC261	409 036 6800	IC M5218L-01
L1036	613 014 1132	HF CHOKE 27UH J
L1037	613 014 1163	HF CHOKE 47UH J
L1038	613 015 6730	HF CHOKE 100UH K
L1039	613 015 6730	HF CHOKE 100UH K
L1061	613 014 1187	HF CHOKE 68UH J
L1070	613 015 6730	HF CHOKE 100UH K
L1071	613 014 1156	HF CHOKE 39UH J
L1072	613 015 6730	HF CHOKE 100UH K
L1073	613 014 1132	HF CHOKE 27UH J
L1074	613 014 1156	HF CHOKE 39UH J
L1075	613 014 1132	HF CHOKE 27UH J
L1091	613 015 6730	HF CHOKE 100UH K
L1092	613 015 6730	HF CHOKE 100UH K
L1101	613 015 6730	HF CHOKE 100UH K
L1103	613 014 1149	HF CHOKE 33UH J
L1120	613 015 6730	HF CHOKE 100UH K
L1140	613 015 6730	HF CHOKE 100UH K
L1141	613 015 6310	HF CHOKE 820UH J
L1165	613 014 1156	HF CHOKE 39UH J
L1166	613 015 6730	HF CHOKE 100UH K
L1167	613 014 1095	HF CHOKE 12UH J
L1168	613 014 1163	HF CHOKE 47UH J
L1169	613 014 1156	HF CHOKE 39UH J
L1170	613 015 6730	HF CHOKE 100UH K
L1180	613 015 6730	HF CHOKE 100UH K
L1201	613 015 6730	HF CHOKE 100UH K
L1202	613 014 1132	HF CHOKE 27UH J
L1204	613 014 1118	HF CHOKE 18UH J
L1205	613 014 1118	HF CHOKE 18UH J
L1206	613 014 1156	HF CHOKE 39UH J
L1208	613 014 1200	HF CHOKE 100UH J
L1209	613 014 1095	HF CHOKE 12UH J
L1210	613 014 1071	HF CHOKE 8.2UH J
L1241	613 014 1125	HF CHOKE 22UH J
L1243	613 014 1194	HF CHOKE 82UH J
L1244	613 014 1194	HF CHOKE 82UH J
L1245	613 015 6730	HF CHOKE 100UH K
L1251	613 015 6730	HF CHOKE 100UH K
L1261	613 015 6730	HF CHOKE 100UH K
L1301	613 015 6730	HF CHOKE 100UH K
L1341	613 015 6112	HF CHOKE 18UH J
L1344	613 015 6105	HF CHOKE 15UH J
L1375	613 014 1231	HF CHOKE 180UH J
L1390	613 014 1194	HF CHOKE 82UH J
L1391	613 015 6365	HF CHOKE 2.2MH J
Q1003	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1004	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1005	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1006	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
Q1006	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1035	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1036	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1037	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1038	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1039	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1040	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1070	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1071	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1091	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1092	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1093	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1101	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1102	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1105	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1106	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1107	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1120	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1121	405 024 0409	TR 2SD545-F-NP-AA
OR	405 024 0607	TR 2SD545-G-NP-AA
Q1140	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1141	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1165	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1806	TR 2SA933S-T93-R
OR	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
Q1166	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q

LOCATION	PARTS NO.	DESCRIPTION
Q1166	405 006 1806	TR 2SA933S-T93-R
Q1180	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1201	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1202	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1203	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1204	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1205	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1206	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1207	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1208	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1240	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1251	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1260	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1262	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1264	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1280	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1281	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1282	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1283	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1303	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1340	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1341	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1341	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1342	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1343	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1375	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1376	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1377	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
OR	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
Q1378	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1379	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1390	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1391	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1980	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
R1001	401 023 4509	CARBON 820K JA 1/4W
R1002	401 023 4509	CARBON 820K JA 1/4W
R1005	401 019 2908	CARBON 39K JA 1/4W
R1006	401 016 3700	CARBON 2.2K JA 1/4W
R1010	401 014 5102	CARBON 15K JA 1/4W
R1012	401 021 4006	CARBON 56K JA 1/4W
R1013	401 105 3701	CARBON 18K JA 1/4W
R1014	401 017 2702	CARBON 27K JA 1/4W
R1016	401 012 8006	CARBON 100K JA 1/4W
R1017	401 012 9201	CARBON 1M JA 1/4W
R1018	401 019 3905	CARBON 390K JA 1/4W
R1019	401 012 6903	CARBON 10K JA 1/4W
R1020	401 016 4707	CARBON 22K JA 1/4W
R1021	401 016 4707	CARBON 22K JA 1/4W
R1022	401 017 1705	CARBON 2.7K JA 1/4W
R1023	401 022 1806	CARBON 680 JA 1/4W
R1024	401 016 3700	CARBON 2.2K JA 1/4W
R1025	401 021 4006	CARBON 56K JA 1/4W
R1026	401 022 1806	CARBON 680 JA 1/4W
R1027	401 016 3700	CARBON 2.2K JA 1/4W
R1028	401 021 8905	CARBON 6.2K JA 1/4W
R1029	401 012 5609	CARBON 1K JA 1/4W
R1030	401 014 5102	CARBON 15K JA 1/4W
R1031	401 012 5609	CARBON 1K JA 1/4W
R1035	401 012 5609	CARBON 1K JA 1/4W
R1036	401 018 8307	CARBON 36K JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION			
R1037	401 014 5102	CARBON	15K	JA	1/4W
R1038	401 014 4006	CARBON	1.5K	JA	1/4W
R1039	401 016 7401	CARBON	240	JA	1/4W
R1040	401 012 5609	CARBON	1K	JA	1/4W
R1043	401 018 4804	CARBON	33K	JA	1/4W
R1044	401 014 5102	CARBON	15K	JA	1/4W
R1047	401 017 0708	CARBON	270	JA	1/4W
R1048	401 018 3708	CARBON	3.3K	JA	1/4W
R1049	401 019 1802	CARBON	3.9K	JA	1/4W
R1050	401 013 1303	CARBON	1.1K	JA	1/4W
R1051	401 019 1802	CARBON	3.9K	JA	1/4W
R1052	401 012 5609	CARBON	1K	JA	1/4W
R1053	401 022 1806	CARBON	680	JA	1/4W
R1054	401 012 5609	CARBON	1K	JA	1/4W
R1055	401 018 4804	CARBON	33K	JA	1/4W
R1056	401 105 3701	CARBON	18K	JA	1/4W
R1057	401 013 5202	CARBON	1.2K	JA	1/4W
R1058	401 017 8506	CARBON	300	JA	1/4W
R1060	401 013 5202	CARBON	1.2K	JA	1/4W
R1061	401 016 2505	CARBON	220	JA	1/4W
R1062	401 018 9700	CARBON	39	JA	1/4W
R1064	401 023 1607	CARBON	820	JA	1/4W
R1065	401 012 5609	CARBON	1K	JA	1/4W
R1066	401 016 3700	CARBON	2.2K	JA	1/4W
R1070	401 012 5708	CARBON	1K	JA	1/4W
R1071	401 018 3708	CARBON	3.3K	JA	1/4W
R1072	401 018 3708	CARBON	3.3K	JA	1/4W
R1073	401 022 1806	CARBON	680	JA	1/4W
R1074	401 018 3708	CARBON	3.3K	JA	1/4W
R1090	401 012 5609	CARBON	1K	JA	1/4W
R1091	401 022 1806	CARBON	680	JA	1/4W
R1092	401 013 6308	CARBON	12K	JA	1/4W
R1093	401 015 2605	CARBON	1.8K	JA	1/4W
R1094	401 020 2805	CARBON	47K	JA	1/4W
R1095	401 022 1806	CARBON	680	JA	1/4W
R1096	401 012 5609	CARBON	1K	JA	1/4W
R1097	401 013 9408	CARBON	1.3K	JA	1/4W
R1098	401 022 1806	CARBON	680	JA	1/4W
R1099	401 012 5609	CARBON	1K	JA	1/4W
R1102	401 023 6909	CARBON	910	JA	1/4W
R1103	401 016 3700	CARBON	2.2K	JA	1/4W
R1104	401 023 1607	CARBON	820	JA	1/4W
R1105	401 016 4707	CARBON	22K	JA	1/4W
R1106	401 023 1607	CARBON	820	JA	1/4W
R1108	401 016 4707	CARBON	22K	JA	1/4W
R1110	401 023 1607	CARBON	820	JA	1/4W
R1111	401 012 5609	CARBON	1K	JA	1/4W
R1112	401 012 5609	CARBON	1K	JA	1/4W
R1113	401 018 3708	CARBON	3.3K	JA	1/4W
R1116	401 012 9201	CARBON	1M	JA	1/4W
R1117	401 012 9201	CARBON	1M	JA	1/4W
R1118	401 012 9201	CARBON	1M	JA	1/4W
R1119	401 012 9201	CARBON	1M	JA	1/4W
R1120	401 012 5609	CARBON	1K	JA	1/4W
R1122	401 016 3700	CARBON	2.2K	JA	1/4W
R1123	401 016 3700	CARBON	2.2K	JA	1/4W
R1125	401 012 5609	CARBON	1K	JA	1/4W
R1126	401 103 7604	CARBON	3.3K	GA	1/4W
R1127	401 103 7505	CARBON	1.5K	GA	1/4W
R1128	401 012 5609	CARBON	1K	JA	1/4W
R1129	401 020 0702	CARBON	470	JA	1/4W
R1130	401 103 7604	CARBON	3.3K	GA	1/4W
R1131	401 103 7406	CARBON	1K	GA	1/4W
R1132	401 023 3601	CARBON	82K	JA	1/4W
R1133	401 103 7406	CARBON	1K	GA	1/4W
R1134	401 014 4006	CARBON	1.5K	JA	1/4W
R1135	401 018 3708	CARBON	3.3K	JA	1/4W
R1136	401 020 0702	CARBON	470	JA	1/4W
R1137	401 018 3708	CARBON	3.3K	JA	1/4W
R1138	401 012 5609	CARBON	1K	JA	1/4W
R1140	401 019 2908	CARBON	39K	JA	1/4W
R1141	401 013 7206	CARBON	120K	JA	1/4W
R1142	401 020 3802	CARBON	470K	JA	1/4W
R1143	401 019 3905	CARBON	390K	JA	1/4W
R1144	401 022 6702	CARBON	75	JA	1/4W
R1146	401 018 2701	CARBON	330	JA	1/4W
R1147	401 087 3708	MT-FILM	2.2K	FD	1/6W
R1148	401 098 1403	MT-FILM	9.1K	FD	1/6W
R1149	401 052 7106	MT-FILM	100K	FD	1/6W
R1150	401 022 3008	CARBON	6.8K	JA	1/4W
R1151	401 020 3802	CARBON	470K	JA	1/4W
R1152	401 012 8006	CARBON	100K	JA	1/4W
R1153	401 021 2903	CARBON	5.6K	JA	1/4W
R1154	401 017 2702	CARBON	27K	JA	1/4W
R1155	401 012 5609	CARBON	1K	JA	1/4W
R1156	401 016 3700	CARBON	2.2K	JA	1/4W
R1157	401 015 2605	CARBON	1.8K	JA	1/4W
R1158	401 012 8006	CARBON	100K	JA	1/4W
R1159	401 018 3708	CARBON	3.3K	JA	1/4W
R1161	401 012 9201	CARBON	1M	JA	1/4W
R1162	401 013 5202	CARBON	1.2K	JA	1/4W
R1165	401 015 2605	CARBON	1.8K	JA	1/4W
R1166	401 018 3708	CARBON	3.3K	JA	1/4W
R1167	401 016 3700	CARBON	2.2K	JA	1/4W
R1168	401 015 2605	CARBON	1.8K	JA	1/4W
R1169	401 018 3708	CARBON	3.3K	JA	1/4W
R1170	401 022 1806	CARBON	680	JA	1/4W
R1171	401 012 5609	CARBON	1K	JA	1/4W
R1172	401 012 5609	CARBON	1K	JA	1/4W
R1173	401 014 4006	CARBON	1.5K	JA	1/4W
R1180	401 012 4404	CARBON	100	JA	1/4W
R1181	401 105 3701	CARBON	18K	JA	1/4W
R1182	401 012 6903	CARBON	10K	JA	1/4W
R1183	401 012 6903	CARBON	10K	JA	1/4W
R1184	401 020 0702	CARBON	470	JA	1/4W
R1186	401 012 6903	CARBON	10K	JA	1/4W
R1187	401 020 1907	CARBON	4.7K	JA	1/4W
R1188	401 012 6903	CARBON	10K	JA	1/4W
R1189	401 020 2805	CARBON	47K	JA	1/4W
R1190	401 020 2805	CARBON	47K	JA	1/4W
R1191	401 018 3708	CARBON	3.3K	JA	1/4W
R1192	401 016 3700	CARBON	2.2K	JA	1/4W
R1193	401 012 4404	CARBON	100	JA	1/4W
R1194	401 016 3700	CARBON	2.2K	JA	1/4W
R1201	401 021 0602	CARBON	56	JA	1/4W
R1202	401 022 1806	CARBON	680	JA	1/4W
R1203	401 022 1806	CARBON	680	JA	1/4W
R1204	401 012 5609	CARBON	1K	JA	1/4W
R1206	401 016 3700	CARBON	2.2K	JA	1/4W
R1207	401 015 2605	CARBON	1.8K	JA	1/4W
R1208	401 013 5202	CARBON	1.2K	JA	1/4W
R1209	401 014 4006	CARBON	1.5K	JA	1/4W
R1210	401 013 5202	CARBON	1.2K	JA	1/4W
R1211	401 018 2701	CARBON	330	JA	1/4W
R1212	401 016 2505	CARBON	220	JA	1/4W
R1213	401 012 5609	CARBON	1K	JA	1/4W
R1214	401 021 0602	CARBON	56	JA	1/4W
R1215	401 022 1806	CARBON	680	JA	1/4W
R1216	401 022 1806	CARBON	680	JA	1/4W
R1217	401 016 3700	CARBON	2.2K	JA	1/4W
R1219	401 016 3700	CARBON	2.2K	JA	1/4W
R1220	401 021 1807	CARBON	560	JA	1/4W
R1222	401 017 9701	CARBON	30K	JA	1/4W
R1223	401 012 5609	CARBON	1K	JA	1/4W
R1234	401 014 5102	CARBON	15K	JA	1/4W
R1235	401 020 0702	CARBON	470	JA	1/4W
R1237	401 023 1607	CARBON	820	JA	1/4W
R1238	401 016 2505	CARBON	220	JA	1/4W

LOCATION	PARTS NO.	DESCRIPTION
R1239	401 016 4707	CARBON 22K JA 1/4W
R1240	401 018 7508	CARBON 360 JA 1/4W
R1241	401 013 5202	CARBON 1.2K JA 1/4W
R1242	401 021 8103	CARBON 620 JA 1/4W
R1243	401 017 1705	CARBON 2.7K JA 1/4W
R1244	401 016 3700	CARBON 2.2K JA 1/4W
R1245	401 017 1705	CARBON 2.7K JA 1/4W
R1246	401 022 0700	CARBON 68 JA 1/4W
R1252	401 012 5609	CARBON 1K JA 1/4W
R1253	401 012 5609	CARBON 1K JA 1/4W
R1256	401 012 5609	CARBON 1K JA 1/4W
R1257	401 022 1806	CARBON 680 JA 1/4W
R1258	401 012 5609	CARBON 1K JA 1/4W
R1259	401 022 0700	CARBON 68 JA 1/4W
R1260	401 018 3708	CARBON 3.3K JA 1/4W
R1262	401 022 1806	CARBON 680 JA 1/4W
R1263	401 022 1806	CARBON 680 JA 1/4W
R1269	401 012 5609	CARBON 1K JA 1/4W
R1288	401 020 2805	CARBON 47K JA 1/4W
R1289	401 019 2908	CARBON 39K JA 1/4W
R1290	401 018 7508	CARBON 360 JA 1/4W
R1292	401 022 1806	CARBON 680 JA 1/4W
R1293	401 022 1806	CARBON 680 JA 1/4W
R1294	401 013 5202	CARBON 1.2K JA 1/4W
R1295	401 013 5202	CARBON 1.2K JA 1/4W
R1296	401 023 1607	CARBON 820 JA 1/4W
R1297	401 022 1806	CARBON 680 JA 1/4W
R1298	401 019 0904	CARBON 390 JA 1/4W
R1299	401 018 3708	CARBON 3.3K JA 1/4W
R1301	401 012 5708	CARBON 1K JA 1/4W
R1302	401 012 5609	CARBON 1K JA 1/4W
R1303	401 014 0206	CARBON 130K JA 1/4W
R1304	401 013 6308	CARBON 12K JA 1/4W
R1305	401 020 3802	CARBON 470K JA 1/4W
R1306	401 092 0808	MT-FILM 82K FD 1/6W
R1308	401 020 2805	CARBON 47K JA 1/4W
R1309	401 012 5609	CARBON 1K JA 1/4W
R1315	401 014 5102	CARBON 15K JA 1/4W
R1316	401 012 6903	CARBON 10K JA 1/4W
R1317	401 018 3708	CARBON 3.3K JA 1/4W
R1318	401 012 5609	CARBON 1K JA 1/4W
R1341	401 018 3708	CARBON 3.3K JA 1/4W
R1342	401 019 1802	CARBON 3.9K JA 1/4W
R1343	401 015 9406	CARBON 2K JA 1/4W
R1344	401 020 1907	CARBON 4.7K JA 1/4W
R1345	401 016 4707	CARBON 22K JA 1/4W
R1346	401 016 4707	CARBON 22K JA 1/4W
R1347	401 018 4804	CARBON 33K JA 1/4W
R1348	401 018 0202	CARBON 300K JA 1/4W
R1349	401 018 5702	CARBON 330K JA 1/4W
R1350	401 017 9206	CARBON 3K JA 1/4W
R1351	401 021 2903	CARBON 5.6K JA 1/4W
R1352	401 016 4806	CARBON 22K JA 1/4W
R1353	401 016 3700	CARBON 2.2K JA 1/4W
R1354	401 017 9206	CARBON 3K JA 1/4W
R1355	401 012 5609	CARBON 1K JA 1/4W
R1356	401 012 5609	CARBON 1K JA 1/4W
R1357	401 016 4806	CARBON 22K JA 1/4W
R1358	401 016 4707	CARBON 22K JA 1/4W
R1359	401 018 3708	CARBON 3.3K JA 1/4W
R1360	401 015 2605	CARBON 1.8K JA 1/4W
R1361	401 012 5609	CARBON 1K JA 1/4W
R1362	401 022 1806	CARBON 680 JA 1/4W
R1364	401 020 0702	CARBON 470 JA 1/4W
R1365	401 012 5609	CARBON 1K JA 1/4W
R1366	401 018 4804	CARBON 33K JA 1/4W
R1367	401 012 5609	CARBON 1K JA 1/4W
R1368	401 105 3701	CARBON 18K JA 1/4W
R1369	401 020 0702	CARBON 470 JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R1370	401 014 4006	CARBON 1.5K JA 1/4W
R1371	401 012 6903	CARBON 10K JA 1/4W
R1372	401 016 4806	CARBON 22K JA 1/4W
R1373	401 016 4707	CARBON 22K JA 1/4W
R1374	401 013 5202	CARBON 1.2K JA 1/4W
R1375	401 016 3700	CARBON 2.2K JA 1/4W
R1376	401 018 3708	CARBON 3.3K JA 1/4W
R1377	401 020 1907	CARBON 4.7K JA 1/4W
R1378	401 012 5609	CARBON 1K JA 1/4W
R1379	401 012 6903	CARBON 10K JA 1/4W
R1380	401 020 2805	CARBON 47K JA 1/4W
R1381	401 012 5609	CARBON 1K JA 1/4W
R1382	401 017 0708	CARBON 270 JA 1/4W
R1383	401 012 5609	CARBON 1K JA 1/4W
R1384	401 012 5609	CARBON 1K JA 1/4W
R1385	401 016 4707	CARBON 22K JA 1/4W
R1386	401 016 4707	CARBON 22K JA 1/4W
R1387	401 012 6903	CARBON 10K JA 1/4W
R1388	401 016 4707	CARBON 22K JA 1/4W
R1389	401 016 4707	CARBON 22K JA 1/4W
R1390	401 012 5609	CARBON 1K JA 1/4W
R1391	401 021 8103	CARBON 620 JA 1/4W
R1393	401 012 6903	CARBON 10K JA 1/4W
R1394	401 012 5609	CARBON 1K JA 1/4W
R1395	401 017 0708	CARBON 270 JA 1/4W
R1396	401 022 0700	CARBON 68 JA 1/4W
R1397	401 012 7009	CARBON 10K JA 1/4W
R1398	401 023 2703	CARBON 8.2K JA 1/4W
R1399	401 018 3708	CARBON 3.3K JA 1/4W
R1961	401 016 3700	CARBON 2.2K JA 1/4W
R1962	401 012 5609	CARBON 1K JA 1/4W
R1963	401 016 4707	CARBON 22K JA 1/4W
R1964	401 016 4707	CARBON 22K JA 1/4W
R1990	401 023 1607	CARBON 820 JA 1/4W
R2601	401 012 8006	CARBON 100K JA 1/4W
R2602	401 019 9501	CARBON 47 JA 1/4W
R2603	401 012 4404	CARBON 100 JA 1/4W
R2604	401 016 4707	CARBON 22K JA 1/4W
R2605	401 012 6903	CARBON 10K JA 1/4W
R2606	401 012 6903	CARBON 10K JA 1/4W
R2607	401 012 8006	CARBON 100K JA 1/4W
R2608	401 012 8006	CARBON 100K JA 1/4W
VR101	613 001 9097	SEMI VR 100KB
OR	613 001 9455	SEMI VR 100KB
VR102	613 001 9097	SEMI VR 100KB
OR	613 001 9455	SEMI VR 100KB
VR103	613 001 9035	SEMI VR 10KB
OR	613 001 9417	SEMI VR 10KB
VR104	613 001 9035	SEMI VR 10KB
OR	613 001 9417	SEMI VR 10KB
VR106	613 001 8991	SEMI VR 2.2KB
VR107	613 001 8977	SEMI VR 1KB
OR	613 001 9370	SEMI VR 1KB
VR108	613 001 8977	SEMI VR 1KB
OR	613 001 9370	SEMI VR 1KB
VR109	613 001 9011	SEMI VR 4.7KB
OR	613 001 9400	SEMI VR 5KB
VR110	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
VR111	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
VR112	613 001 9035	SEMI VR 10KB
OR	613 001 9417	SEMI VR 10KB
VR113	613 001 9073	SEMI VR 47KB
OR	613 001 9448	SEMI VR 50KB
VR114	613 001 9073	SEMI VR 47KB
OR	613 001 9448	SEMI VR 50KB
VR115	613 001 8991	SEMI VR 2.2KB

LOCATION	PARTS NO.	DESCRIPTION
VR115	613 001 9387	SEMI VR 2KB
VR116	613 001 9011	SEMI VR 4.7KB
OR	613 001 9400	SEMI VR 5KB
VR117	613 001 9011	SEMI VR 4.7KB
OR	613 001 9400	SEMI VR 5KB
VR118	613 001 8977	SEMI VR 1KB
OR	613 001 9370	SEMI VR 1KB
VR119	613 001 8991	SEMI VR 2.2KB
OR	613 001 9387	SEMI VR 2KB
VR121	613 001 9073	SEMI VR 47KB
OR	613 001 9448	SEMI VR 50KB
VR123	613 001 8977	SEMI VR 1KB
OR	613 001 9370	SEMI VR 1KB
VR124	613 001 8977	SEMI VR 1KB
OR	613 001 9370	SEMI VR 1KB
VR126	613 001 9059	SEMI VR 22KB
OR	613 001 9424	SEMI VR 20KB
VR127	613 001 9059	SEMI VR 22KB
OR	613 001 9424	SEMI VR 20KB
VR130	613 001 9097	SEMI VR 100KB
OR	613 001 9455	SEMI VR 100KB
X1001	613 088 0789	FILTER,6MHZ L.P.F
X1003	613 091 7928	FILTER,6MHZ
X1004	613 084 3500	FILTER
X1201	613 079 2402	FILTER 1.4M,4.43M,5.06MHZ
X1301	613 002 7818	CRYSTAL 4.433619MHZ 16PF

COMPL,VD-3

COMPL.NO. 613 087 4962

LOCATION	PARTS NO.	DESCRIPTION
	613 079 8619	SHIELD
	613 079 8626	SHIELD
B1751	405 018 2501	TR 2SC3399-AC
B1752	405 018 2501	TR 2SC3399-AC
B1753	405 018 2501	TR 2SC3399-AC
C1751	403 041 9405	ELECT 10U M 16V
C1752	403 001 1906	CERAMIC 0.01U M 16V
C1753	403 001 1906	CERAMIC 0.01U M 16V
C1754	403 003 7104	CERAMIC 0.033U M 25V
C1755	403 070 3702	CERAMIC 120P J 50V
C1756	403 069 1207	CERAMIC 1000P K 50V
C1757	403 022 5907	CERAMIC 33P J 50V
C1758	403 001 1906	CERAMIC 0.01U M 16V
C1759	403 028 3402	CERAMIC 56P J 50V
C1760	403 001 1906	CERAMIC 0.01U M 16V
C1761	403 001 1906	CERAMIC 0.01U M 16V
C1762	403 001 1906	CERAMIC 0.01U M 16V
C1763	403 001 1906	CERAMIC 0.01U M 16V
C1765	403 001 1906	CERAMIC 0.01U M 16V
C1766	403 068 8801	CERAMIC 100P J 50V
C1767	403 068 8801	CERAMIC 100P J 50V
C1768	403 001 1906	CERAMIC 0.01U M 16V
C1769	403 040 2209	ELECT 22U M 10V
IC175	409 051 1200	IC TC4030BP
IC176	409 020 7202	IC LC4013B
L1751	613 015 6082	HF CHOKE 10UH J
L1752	613 014 1057	HF CHOKE 5.6UH J
OR	613 014 4577	HF CHOKE 5.6UH J
L1753	613 014 0753	HF CHOKE 1.5UH M
OR	613 014 4270	HF CHOKE 1.5UH K
Q1751	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1752	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1753	405 012 9506	TR 2SC2058S-DCTP-Q
OR	405 016 0905	TR 2SC2839-E-SPA-AC
OR	405 016 1100	TR 2SC2839-F-SPA-AC
Q1754	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1755	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
OR	405 006 1707	TR 2SA933S-TP-Q
OR	405 006 1806	TR 2SA933S-T93-R
Q1756	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
Q1757	405 011 8401	TR 2SC1740S-DCTP-Q
OR	405 011 8500	TR 2SC1740S-DCTP-R
OR	405 019 2005	TR 2SC536-E-SPA-AC
OR	405 019 2807	TR 2SC536-F-SPA-AC
R1751	401 012 5609	CARBON 1K JA 1/4W
R1752	401 012 6903	CARBON 10K JA 1/4W
R1753	401 017 1705	CARBON 2.7K JA 1/4W
R1754	401 016 4707	CARBON 22K JA 1/4W
R1755	401 105 3701	CARBON 18K JA 1/4W
R1756	401 018 1506	CARBON 33 JA 1/4W
R1757	401 013 5202	CARBON 1.2K JA 1/4W
R1758	401 014 5102	CARBON 15K JA 1/4W
R1759	401 014 5102	CARBON 15K JA 1/4W
R1760	401 013 5202	CARBON 1.2K JA 1/4W
R1761	401 018 2701	CARBON 330 JA 1/4W
R1762	401 023 0600	CARBON 82 JA 1/4W
R1763	401 020 0702	CARBON 470 JA 1/4W
R1764	401 012 5609	CARBON 1K JA 1/4W
R1765	401 020 1907	CARBON 4.7K JA 1/4W
R1766	401 020 1907	CARBON 4.7K JA 1/4W
R1767	401 012 5609	CARBON 1K JA 1/4W
R1768	401 016 1409	CARBON 22 JA 1/4W
R1769	401 016 1409	CARBON 22 JA 1/4W
R1770	401 017 1705	CARBON 2.7K JA 1/4W
R1771	401 015 2605	CARBON 1.8K JA 1/4W
R1772	401 012 6903	CARBON 10K JA 1/4W
R1773	401 020 3802	CARBON 470K JA 1/4W
R1774	401 012 6903	CARBON 10K JA 1/4W
R1775	401 020 3802	CARBON 470K JA 1/4W
R1776	401 012 6903	CARBON 10K JA 1/4W
R1791	401 012 6903	CARBON 10K JA 1/4W
R1792	401 012 6903	CARBON 10K JA 1/4W
R1793	401 012 6903	CARBON 10K JA 1/4W
R1795	401 012 6903	CARBON 10K JA 1/4W
R1796	401 012 6903	CARBON 10K JA 1/4W
R1797	401 020 1907	CARBON 4.7K JA 1/4W

COMPL,DM-1

COMPL.NO. 613 090 3747

LOCATION	PARTS NO.	DESCRIPTION
B4701	405 018 1900	TR 2SC3395-TB
B4711	405 018 2501	TR 2SC3399
C4701	403 018 7403	CERAMIC 220P J 50V
C4702	403 018 7403	CERAMIC 220P J 50V
C4703	403 049 0800	ELECT 1U M 50V
C4704	403 073 1200	CERAMIC 0.033U K 50V
C4705	403 049 0800	ELECT 1U M 50V

LOCATION	PARTS NO.	DESCRIPTION
C4706	403 074 3104	CERAMIC 0.047U Z 50V
C4707	403 069 5601	CERAMIC 0.01U K 50V
C4708	403 049 0800	ELECT 1U M 50V
C4709	403 073 1200	CERAMIC 0.033U K 50V
C4710	403 018 7403	CERAMIC 220P J 50V
C4711	403 023 4404	CERAMIC 330P J 50V
C4712	403 031 2102	CERAMIC 680P J 50V
C4713	403 028 9800	CERAMIC 560P J 50V
C4715	403 011 4904	CERAMIC 120P J 50V
C4716	403 048 2508	ELECT 0.22U M 50V
C4717	403 075 2205	CERAMIC 0.068U K 50V
C4718	403 075 2205	CERAMIC 0.068U K 50V
C4719	403 011 4904	CERAMIC 120P J 50V
C4720	403 048 2508	ELECT 0.22U M 50V
C4721	403 028 9800	CERAMIC 560P J 50V
C4722	403 031 2102	CERAMIC 680P J 50V
C4723	403 038 6707	ELECT 220U M 6.3V
C4727	403 074 3104	CERAMIC 0.047U Z 50V
C4729	403 069 5601	CERAMIC 0.01U K 50V
C4730	403 040 8003	ELECT 33U M 10V
C4731	403 069 5601	CERAMIC 0.01U K 50V
C4732	403 012 6808	CERAMIC 15P J 50V
C4735	403 014 9203	CERAMIC 180P J 50V
C4736	403 069 5601	CERAMIC 0.01U K 50V
C4737	403 049 0800	ELECT 1U M 50V
C4738	403 069 5601	CERAMIC 0.01U K 50V
C4739	403 046 2104	ELECT 3.3U M 25V
C4740	403 075 2205	CERAMIC 0.068U K 50V
C4741	403 049 0800	ELECT 1U M 50V
C4742	403 041 9405	ELECT 10U M 16V
C4743	403 069 5601	CERAMIC 0.01U K 50V
C4745	403 012 6808	CERAMIC 15P J 50V
C4746	403 048 6902	ELECT 0.47U M 50V
C4747	403 026 7501	CERAMIC 470P J 50V
C4748	403 042 8308	ELECT 22U M 16V
C4749	403 047 0604	ELECT 4.7U M 25V
C4750	403 047 0604	ELECT 4.7U M 25V
C4751	403 048 2508	ELECT 0.22U M 50V
C4752	403 033 4500	CERAMIC 82P J 50V
C4753	403 049 0800	ELECT 1U M 50V
C4754	403 086 2904	NP-ELECT 1U M 50V
C4755	403 012 6808	CERAMIC 15P J 50V
C4756	403 049 0800	ELECT 1U M 50V
C4757	403 049 0800	ELECT 1U M 50V
C4758	403 069 5601	CERAMIC 0.01U K 50V
C4759	403 074 3104	CERAMIC 0.047U Z 50V
C4760	403 039 2609	ELECT 47U M 6.3V
C4761	403 074 3104	CERAMIC 0.047U Z 50V
C4762	403 039 2609	ELECT 47U M 6.3V
C4763	403 069 5601	CERAMIC 0.01U K 50V
C4764	403 165 4508	CERAMIC 0.15U K 16V
C4765	403 074 1902	CERAMIC 0.047U K 50V
C4766	403 049 0800	ELECT 1U M 50V
C4768	403 075 2304	CERAMIC 0.068U Z 50V
C4769	403 049 0800	ELECT 1U M 50V
C4770	403 010 1201	CERAMIC 1000P J 50V
C4771	403 069 5601	CERAMIC 0.01U K 50V
C4772	403 069 5601	CERAMIC 0.01U K 50V
C4773	403 069 5601	CERAMIC 0.01U K 50V
C4774	403 069 5601	CERAMIC 0.01U K 50V
C4775	403 049 0800	ELECT 1U M 50V
C4777	403 039 2609	ELECT 47U M 6.3V
C4778	403 069 5601	CERAMIC 0.01U K 50V
C4779	403 049 0800	ELECT 1U M 50V
C4780	403 069 5601	CERAMIC 0.01U K 50V
C4781	403 028 9800	CERAMIC 560P J 50V
C4782	403 069 5601	CERAMIC 0.01U K 50V
C4785	403 074 3104	CERAMIC 0.047U Z 50V
C4789	403 074 3104	CERAMIC 0.047U Z 50V

LOCATION	PARTS NO.	DESCRIPTION
C4791	403 009 1700	CERAMIC 10P J 50V
C4806	403 009 5708	CERAMIC 100P J 50V
C4807	403 018 7403	CERAMIC 220P J 50V
C4808	403 042 8308	ELECT 22U M 16V
C4809	403 009 5708	CERAMIC 100P J 50V
C4810	403 018 7403	CERAMIC 220P J 50V
C4813	403 074 3104	CERAMIC 0.047U Z 50V
C4817	403 026 2803	CERAMIC 47P J 50V
C4818	403 026 2803	CERAMIC 47P J 50V
C4846	403 069 5700	CERAMIC 0.01U K 50V
C4868	403 072 3403	CERAMIC 0.022U Z 50V
C4869	403 072 3403	CERAMIC 0.022U Z 50V
C4870	403 072 3403	CERAMIC 0.022U Z 50V
C4871	403 072 3403	CERAMIC 0.022U Z 50V
C4873	403 074 3104	CERAMIC 0.047U Z 50V
C4874	403 039 2609	ELECT 47U M 6.3V
C4891	403 074 3104	CERAMIC 0.047U Z 50V
C4892	403 039 2609	ELECT 47U M 6.3V
C4895	403 030 6903	CERAMIC 68P J 50V
CT471	613 002 6255	TRIMMER
D4701	407 004 0201	DIODE DCA015-TB
OR	407 003 4507	DIODE DAP202K-T-96
D4702	407 004 0706	DIODE DCB015-TB
OR	407 003 3609	DIODE DAN202K-T-96
D4711	407 012 4406	DIODE 1SS133-T-77
D4712	407 012 4406	DIODE 1SS133-T-77
D4761	407 004 0201	DIODE DCA015-TB
OR	407 003 4507	DIODE DAP202K-T-96
D4811	407 004 0201	DIODE DCA015-TB
OR	407 003 4507	DIODE DAP202K-T-96
IC472	409 052 1902	IC TC74HC04F
IC473	409 133 1104	IC LA7400
IC474	409 167 1705	IC LA7402M
IC477	409 115 3300	IC M51271FP
J4743	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4770	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4771	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4772	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4773	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4774	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4775	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4776	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4777	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4778	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4779	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4781	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4782	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4783	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4784	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4785	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4786	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4787	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4788	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4789	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4791	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4792	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4793	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4795	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4797	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4798	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4799	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4801	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4802	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4803	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4804	401 037 5004	MT-GLAZE 0.000 ZA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
J4805	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4806	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4807	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4808	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4809	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4811	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4812	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4813	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4814	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4815	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4816	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4817	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4818	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4819	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4821	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4822	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4823	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4824	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4825	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4826	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4827	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4828	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4829	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4831	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4832	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4833	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4834	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4835	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4836	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4837	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4838	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4839	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4841	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4842	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4843	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4844	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4845	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4846	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4847	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4848	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4849	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4851	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4853	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4854	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4855	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4856	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4857	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4858	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4859	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4861	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4862	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4863	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4864	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4865	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4866	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4867	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4868	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4869	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4870	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4871	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4872	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4873	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4874	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4876	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4877	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4878	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J4879	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4880	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4881	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4882	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4883	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4884	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4885	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4886	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4887	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4888	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4889	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4890	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4891	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4892	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4893	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J4894	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
L4732	613 015 6198	HF CHOKE 82UH J
L4733	613 015 6730	HF CHOKE 100UH K
L4734	613 015 6198	HF CHOKE 82UH J
L4761	613 015 6730	HF CHOKE 100UH K
Q4731	405 014 4400	TR 2SC2412K-T96-Q
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4509	TR 2SC2412K-T96-R
Q4732	405 014 4400	TR 2SC2412K-T96-Q
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4509	TR 2SC2412K-T96-R
Q4785	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
OR	405 002 0308	TR 2SA1037K-T96-R
OR	405 002 0209	TR 2SA1037K-T96-Q
Q4786	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4400	TR 2SC2412K-T96-Q
Q4787	405 002 0209	TR 2SA1037K-T96-Q
OR	405 002 0308	TR 2SA1037K-T96-R
OR	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q4788	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4400	TR 2SC2412K-T96-Q
Q4789	405 002 0209	TR 2SA1037K-T96-Q
OR	405 002 0308	TR 2SA1037K-T96-R
OR	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q4790	405 002 0209	TR 2SA1037K-T96-Q
OR	405 002 0308	TR 2SA1037K-T96-R
OR	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q4806	405 078 0400	TR 2SC2413K-T96-P
OR	405 035 6100	TR 2SC2413K-T96-Q
OR	405 015 9701	TR 2SC2814-F4-TB
OR	405 015 9909	TR 2SC2814-F5-TB
Q4807	405 078 0400	TR 2SC2413K-T96-P
OR	405 035 6100	TR 2SC2413K-T96-Q
OR	405 015 9701	TR 2SC2814-F4-TB
OR	405 015 9909	TR 2SC2814-F5-TB
Q4808	405 014 4400	TR 2SC2412K-T96-Q
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4509	TR 2SC2412K-T96-R
Q4809	405 014 4400	TR 2SC2412K-T96-Q
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4509	TR 2SC2412K-T96-R
Q4836	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB

LOCATION	PARTS NO.	DESCRIPTION
Q4836	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4400	TR 2SC2412K-T96-Q
Q4866	405 015 9909	TR 2SC2814-F5-TB
OR	405 015 9701	TR 2SC2814-F4-TB
OR	405 035 6100	TR 2SC2413K-T96-Q
OR	405 078 0400	TR 2SC2413K-T96-P
Q4868	405 002 0209	TR 2SA1037K-T96-Q
OR	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
OR	405 002 0308	TR 2SA1037K-T96-R
Q4873	405 002 0209	TR 2SA1037K-T96-Q
OR	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
OR	405 002 0308	TR 2SA1037K-T96-R
R4701	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R4702	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R4703	401 037 8203	MT-GLAZE 1.5M JA 1/10W
R4704	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R4705	401 037 8203	MT-GLAZE 1.5M JA 1/10W
R4706	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R4707	401 038 7601	MT-GLAZE 560 JA 1/10W
R4708	401 038 6000	MT-GLAZE 43K JA 1/10W
R4709	401 038 6000	MT-GLAZE 43K JA 1/10W
R4710	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R4711	401 037 8104	MT-GLAZE 150K JA 1/10W
R4712	401 037 8104	MT-GLAZE 150K JA 1/10W
R4713	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R4714	401 038 6000	MT-GLAZE 43K JA 1/10W
R4715	401 038 6000	MT-GLAZE 43K JA 1/10W
R4716	401 038 7601	MT-GLAZE 560 JA 1/10W
R4717	401 037 9507	MT-GLAZE 1.8M JA 1/10W
R4720	401 018 5702	CARBON 330K JA 1/4W
R4726	401 037 5608	MT-GLAZE 10K JA 1/10W
R4728	401 037 5608	MT-GLAZE 10K JA 1/10W
R4731	401 037 6803	MT-GLAZE 12K JA 1/10W
R4732	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4734	401 037 6803	MT-GLAZE 12K JA 1/10W
R4735	401 037 9309	MT-GLAZE 18K JA 1/10W
R4736	401 037 6803	MT-GLAZE 12K JA 1/10W
R4737	401 037 8104	MT-GLAZE 150K JA 1/10W
R4738	401 037 7404	MT-GLAZE 13K JA 1/10W
R4739	401 038 3801	MT-GLAZE 330K JA 1/10W
R4741	401 037 5400	MT-GLAZE 1K JA 1/10W
R4742	401 037 5400	MT-GLAZE 1K JA 1/10W
R4743	401 037 9507	MT-GLAZE 1.8M JA 1/10W
R4744	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4745	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R4746	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4747	401 038 7908	MT-GLAZE 560K JA 1/10W
R4748	401 038 6307	MT-GLAZE 470 JA 1/10W
R4749	401 037 5400	MT-GLAZE 1K JA 1/10W
R4750	401 037 5400	MT-GLAZE 1K JA 1/10W
R4751	401 038 7908	MT-GLAZE 560K JA 1/10W
R4752	401 037 5400	MT-GLAZE 1K JA 1/10W
R4755	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4756	401 037 5400	MT-GLAZE 1K JA 1/10W
R4757	401 037 5400	MT-GLAZE 1K JA 1/10W
R4759	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R4761	401 037 5608	MT-GLAZE 10K JA 1/10W
R4762	401 038 5300	MT-GLAZE 39K JA 1/10W
R4763	401 038 0800	MT-GLAZE 22K JA 1/10W
R4764	401 037 8104	MT-GLAZE 150K JA 1/10W
R4765	401 037 5400	MT-GLAZE 1K JA 1/10W
R4766	401 037 5806	MT-GLAZE 1M JA 1/10W
R4767	401 037 8708	MT-GLAZE 16K JA 1/10W
R4768	401 038 3702	MT-GLAZE 33K JA 1/10W
R4769	401 039 1004	MT-GLAZE 9.1K JA 1/10W
R4770	401 037 5400	MT-GLAZE 1K JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
R4771	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R4772	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R4773	401 038 6604	MT-GLAZE 470K JA 1/10W
R4774	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R4775	401 038 5003	MT-GLAZE 390 JA 1/10W
R4776	401 038 5805	MT-GLAZE 430 JA 1/10W
R4777	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R4778	401 037 9309	MT-GLAZE 18K JA 1/10W
R4779	401 038 0800	MT-GLAZE 22K JA 1/10W
R4783	401 037 5202	MT-GLAZE 100 JA 1/10W
R4784	401 037 5202	MT-GLAZE 100 JA 1/10W
R4785	401 037 5202	MT-GLAZE 100 JA 1/10W
R4786	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4787	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4788	401 037 5400	MT-GLAZE 1K JA 1/10W
R4789	401 037 5400	MT-GLAZE 1K JA 1/10W
R4790	401 038 1302	MT-GLAZE 2.4K JA 1/10W
R4791	401 037 5400	MT-GLAZE 1K JA 1/10W
R4794	401 037 5400	MT-GLAZE 1K JA 1/10W
R4795	401 038 1302	MT-GLAZE 2.4K JA 1/10W
R4796	401 037 5400	MT-GLAZE 1K JA 1/10W
R4801	401 037 5400	MT-GLAZE 1K JA 1/10W
R4802	401 037 5202	MT-GLAZE 100 JA 1/10W
R4803	401 037 5400	MT-GLAZE 1K JA 1/10W
R4804	401 037 5202	MT-GLAZE 100 JA 1/10W
R4806	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R4807	401 038 9605	MT-GLAZE 750 JA 1/10W
R4808	401 037 5400	MT-GLAZE 1K JA 1/10W
R4809	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R4810	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R4811	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R4812	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R4813	401 038 9605	MT-GLAZE 750 JA 1/10W
R4814	401 037 5400	MT-GLAZE 1K JA 1/10W
R4815	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4816	401 037 7305	MT-GLAZE 1.3K JA 1/10W
R4833	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4836	401 037 5202	MT-GLAZE 100 JA 1/10W
R4838	401 037 5400	MT-GLAZE 1K JA 1/10W
R4839	401 037 5400	MT-GLAZE 1K JA 1/10W
R4840	401 039 0304	MT-GLAZE 820 JA 1/10W
R4841	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4843	401 037 5400	MT-GLAZE 1K JA 1/10W
R4862	401 037 5400	MT-GLAZE 1K JA 1/10W
R4864	401 037 5400	MT-GLAZE 1K JA 1/10W
R4867	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R4868	401 038 6307	MT-GLAZE 470 JA 1/10W
R4870	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R4871	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R4872	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4873	401 037 5400	MT-GLAZE 1K JA 1/10W
R4878	401 037 5608	MT-GLAZE 10K JA 1/10W
R4886	401 037 6100	MT-GLAZE 1.1K JA 1/10W
R4887	401 037 6100	MT-GLAZE 1.1K JA 1/10W
R4890	401 037 5400	MT-GLAZE 1K JA 1/10W
R4893	401 037 5400	MT-GLAZE 1K JA 1/10W
R4894	401 037 5400	MT-GLAZE 1K JA 1/10W
R4895	401 012 5609	CARBON 1K JA 1/4W
R4896	401 020 1907	CARBON 4.7K JA 1/4W
T4701	613 083 0098	FILTER,1.2MHZ L.P.
OR	613 088 6736	FILTER,1.2MHZ L.P.F
T4702	613 016 4919	HF COIL TRANS
OR	613 016 4896	HF COIL TRANS
OR	613 016 4902	HF COIL TRANS
OR	613 082 9498	HF COIL TRNAS
T4703	613 016 4919	HF COIL TRANS
OR	613 016 4896	HF COIL TRANS
OR	613 016 4902	HF COIL TRANS

LOCATION	PARTS NO.	DESCRIPTION
T4703	613 082 9498	HF COIL TRNAS
T4704	613 083 0104	FILTER,4MHZ L.P.
OR	613 088 6743	FILTER,4MHZ L.P.F
T4705	613 016 4759	HF COIL TRANS
OR	613 016 4735	HF COIL TRANS
OR	613 016 4742	HF COIL TRANS
OR	613 082 9443	HF COIL TRANS
VR471	613 001 8618	SEMI VR 10KB
VR472	613 001 8601	SEMI VR 5KB
VR473	613 001 8571	SEMI VR 1KB
VR474	613 001 8649	SEMI VR 50KB
VR475	613 001 8649	SEMI VR 50KB
VR476	613 001 8571	SEMI VR 1KB
VR477	613 001 8649	SEMI VR 50KB
VR478	613 001 8571	SEMI VR 1KB
X4701	613 077 1124	CERAMIC RESONATOR
X4702	613 077 1124	CERAMIC RESONATOR
X4703	613 080 9407	OSC,CRYSTAL 4.43MHZ
X4704	613 002 8709	CRYSTAL
XF472	613 085 9433	FILTER
XF473	613 085 9433	FILTER

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COMPL.NO. 613 081 4913

LOCATION	PARTS NO.	DESCRIPTION
C4301	403 072 3403	CERAMIC 0.022U Z 50V
C4302	403 072 3403	CERAMIC 0.022U Z 50V
C4303	403 072 3403	CERAMIC 0.022U Z 50V
C4304	403 072 3403	CERAMIC 0.022U Z 50V
C4305	403 072 3403	CERAMIC 0.022U Z 50V
C4306	403 072 3403	CERAMIC 0.022U Z 50V
C4307	403 072 3403	CERAMIC 0.022U Z 50V
C4308	403 039 2708	ELECT 47U M 6.3V
C4309	403 049 1005	ELECT 1U M 50V
C4310	403 039 2708	ELECT 47U M 6.3V
C4311	403 068 0409	CERAMIC 0.1U Z 25V
C4312	403 039 2708	ELECT 47U M 6.3V
C4313	403 068 0409	CERAMIC 0.1U Z 25V
C4314	403 039 2708	ELECT 47U M 6.3V
C4315	403 068 0409	CERAMIC 0.1U Z 25V
C4316	403 049 1005	ELECT 1U M 50V
C4317	403 049 1005	ELECT 1U M 50V
C4318	403 049 1005	ELECT 1U M 50V
C4319	403 049 1005	ELECT 1U M 50V
C4320	403 049 1005	ELECT 1U M 50V
C4321	403 049 1005	ELECT 1U M 50V
C4322	403 047 0802	ELECT 4.7U M 25V
C4323	403 049 1005	ELECT 1U M 50V
C4324	403 047 0802	ELECT 4.7U M 25V
C4325	403 049 1005	ELECT 1U M 50V
C4326	403 047 0802	ELECT 4.7U M 25V
C4327	403 049 1005	ELECT 1U M 50V
C4328	403 068 0409	CERAMIC 0.1U Z 25V
C4329	403 068 0409	CERAMIC 0.1U Z 25V
C4330	403 068 0409	CERAMIC 0.1U Z 25V
C4331	403 039 2708	ELECT 47U M 6.3V
C4332	403 049 1005	ELECT 1U M 50V
C4333	403 030 6903	CERAMIC 68P J 50V
C4334	403 069 5601	CERAMIC 0.01U K 50V
C4335	403 090 3706	TA-SOLID 10U K 10V
C4336	403 047 0802	ELECT 4.7U M 25V
C4337	403 068 0409	CERAMIC 0.1U Z 25V
C4338	403 027 1201	CERAMIC 5P C 50V
C4339	403 027 1201	CERAMIC 5P C 50V
C4340	403 047 0802	ELECT 4.7U M 25V
C4341	403 010 1102	CERAMIC 1000P J 50V
C4342	403 010 1102	CERAMIC 1000P J 50V
D4301	407 004 0706	DIODE DCB015-TB
OR	407 003 3609	DIODE DAN202K-T-96
D4302	407 004 0706	DIODE DCB015-TB
OR	407 003 3609	DIODE DAN202K-T-96
D4303	407 004 0706	DIODE DCB015-TB
OR	407 003 3609	DIODE DAN202K-T-96
IC431	409 141 4302	IC M50541FP
IC432	409 132 3802	IC M5M4C500L
IC433	409 149 9804	IC M52686AFP
IC434	409 131 1007	IC M52679FP
IC435	409 131 1007	IC M52679FP
IC436	409 131 1007	IC M52679FP
IC437	409 044 2702	IC SN74S124N
IC438	409 160 9609	IC BU74HCU04F
OR	409 086 6706	IC LC74HCU04M
OR	409 127 6108	IC UPD74HCU04G
OR	409 111 7807	IC MN74HCU04S
OR	409 175 2503	IC SN74HCU04NS
IC439	409 160 9500	IC BA225F
L4301	613 017 0316	CORE
L4302	613 017 0316	CORE
L4303	613 017 0316	CORE
L4304	613 017 0316	CORE
L4305	613 014 0777	HF CHOKE 2.2UH M
L4306	613 014 0777	HF CHOKE 2.2UH M
Q4301	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4400	TR 2SC2412K-T96-Q
R4301	401 037 5707	MT-GLAZE 100K JA 1/10W
R4302	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R4303	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R4304	401 037 6001	MT-GLAZE 110 JA 1/10W
R4305	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R4306	401 037 5806	MT-GLAZE 1M JA 1/10W
R4307	401 038 2309	MT-GLAZE 270K JA 1/10W
R4308	401 038 2309	MT-GLAZE 270K JA 1/10W
R4311	401 037 5707	MT-GLAZE 100K JA 1/10W
R4312	401 037 5707	MT-GLAZE 100K JA 1/10W
VR431	613 001 5600	SEMI VR 22KB
X4301	613 082 9184	OSC,CRYSTAL 30MHZ
XF431	613 086 4505	FILTER
XF432	613 086 4505	FILTER
XF433	613 086 4475	FILTER
XF434	613 086 4475	FILTER
XF435	613 086 4475	FILTER
XF436	613 086 4475	FILTER
XF437	613 086 4475	FILTER
XF438	613 086 4475	FILTER
XF439	613 086 4475	FILTER
XF440	613 086 4475	FILTER
XF441	613 086 4475	FILTER
XF442	613 086 4475	FILTER
XF443	613 086 4475	FILTER
XF444	613 086 4475	FILTER
XF445	613 086 4475	FILTER
XF446	613 088 6248	FILTER
XF447	613 088 6248	FILTER
XF448	613 088 6248	FILTER
XF449	613 088 6248	FILTER

LOCATION	PARTS NO.	DESCRIPTION
XF450	613 088 6248	FILTER
XF451	613 086 4475	FILTER
XF452	613 086 4475	FILTER
XF453	613 086 4505	FILTER
XF454	613 086 4505	FILTER
XF455	613 086 4505	FILTER
XF456	613 086 4505	FILTER
XF457	613 086 4475	FILTER
XF458	613 086 4475	FILTER
XF459	613 088 6248	FILTER
XF460	613 086 4475	FILTER

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LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 090 3716	
C7501	403 038 2105	ELECT 100U M 6.3V
C7502	403 121 9509	CERAMIC 0.1U Z 50V
C7503	403 022 7703	CERAMIC 33P J 50V
C7504	403 022 7703	CERAMIC 33P J 50V
C7506	403 040 8102	ELECT 33U M 10V
C7510	403 056 9605	POLYESTER 0.01U J 50V
C7514	403 056 9605	POLYESTER 0.01U J 50V
C7518	403 042 8407	ELECT 22U M 16V
C7519	403 121 9509	CERAMIC 0.1U Z 50V
D7501	407 012 4406	DIODE 1SS133-T-77
IC751	409 173 6800	IC LC6543H-3966
IC752	409 051 6601	IC TC4538BF
IC756	409 032 3704	IC MN1280-R
OR	409 032 3803	IC MN1280-S
L7501	613 015 6730	HF CHOKE 100UH K
R7501	401 022 7105	CARBON 750 JA 1/4W
R7506	401 012 5609	CARBON 1K JA 1/4W
R7507	401 012 5609	CARBON 1K JA 1/4W
R7508	401 012 5609	CARBON 1K JA 1/4W
R7509	401 012 5609	CARBON 1K JA 1/4W
R7510	401 012 5609	CARBON 1K JA 1/4W
R7511	401 012 5609	CARBON 1K JA 1/4W
R7512	401 012 5609	CARBON 1K JA 1/4W
R7513	401 012 5609	CARBON 1K JA 1/4W
R7514	401 012 5609	CARBON 1K JA 1/4W
R7515	401 012 5609	CARBON 1K JA 1/4W
R7516	401 012 5609	CARBON 1K JA 1/4W
R7517	401 012 5609	CARBON 1K JA 1/4W
R7518	401 012 5609	CARBON 1K JA 1/4W
R7520	401 012 6903	CARBON 10K JA 1/4W
R7524	401 012 6903	CARBON 10K JA 1/4W
R7528	401 012 5609	CARBON 1K JA 1/4W
R7529	401 012 5609	CARBON 1K JA 1/4W
R7532	401 012 8006	CARBON 100K JA 1/4W
R7533	401 012 8006	CARBON 100K JA 1/4W
R7534	401 012 6903	CARBON 10K JA 1/4W
R7535	401 012 6903	CARBON 10K JA 1/4W
R7560	401 017 2702	CARBON 27K JA 1/4W
R7561	401 017 2702	CARBON 27K JA 1/4W
RB751	613 080 2514	R-NETWORK,4.7KX11
X7501	613 016 6869	CERAMIC RESONATOR 4MHZ
OR	613 016 7026	CERAMIC RESONATOR 4MHZ

COMPL,VP-1

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 088 1816	

VIDEO PRE-AMP. CIRCUIT(VP-A)

LOCATION	PARTS NO.	DESCRIPTION
	613 077 3135	BRACKET
B1801	405 035 1105	TR FMW1-T98
B1802	405 035 1105	TR FMW1-T98
B1803	405 058 5401	TR FMC2-T98
B1804	407 100 7302	DIODE IMN10-T109
B1805	407 100 7302	DIODE IMN10-T109
B1806	405 035 1105	TR FMW1-T98
B1807	405 029 3504	TR DTC144EK-T96
OR	405 018 1900	TR 2SC3395-TB
B1808	405 029 3504	TR DTC144EK-T96
OR	405 018 1900	TR 2SC3395-TB
B1809	405 035 1105	TR FMW1-T98
B1810	405 029 3504	TR DTC144EK-T96
OR	405 018 1900	TR 2SC3395-TB
B1811	405 074 0602	TR IMZ1-T108
B1812	405 074 0602	TR IMZ1-T108
C1801	403 033 4609	CERAMIC 82P J 50V
C1802	403 026 7600	CERAMIC 470P J 50V
C1804	403 041 9405	ELECT 10U M 16V
C1805	403 067 9809	CERAMIC 0.1U K 25V
C1806	403 067 9809	CERAMIC 0.1U K 25V
C1808	403 041 9405	ELECT 10U M 16V
C1810	403 041 9405	ELECT 10U M 16V
C1811	403 067 9809	CERAMIC 0.1U K 25V
C1812	403 067 9809	CERAMIC 0.1U K 25V
C1814	403 041 9405	ELECT 10U M 16V
C1815	403 010 1102	CERAMIC 1000P J 50V
C1817	403 033 4609	CERAMIC 82P J 50V
C1818	403 049 0800	ELECT 1U M 50V
C1819	403 049 0800	ELECT 1U M 50V
C1820	403 067 9304	CERAMIC 0.01U K 25V
C1821	403 049 0800	ELECT 1U M 50V
C1822	403 068 2007	CERAMIC 0.022U K 25V
C1823	403 010 1102	CERAMIC 1000P J 50V
C1824	403 067 9304	CERAMIC 0.01U K 25V
C1825	403 068 2007	CERAMIC 0.022U K 25V
C1827	403 020 0508	CERAMIC 27P J 50V
C1828	403 067 9304	CERAMIC 0.01U K 25V
C1829	403 039 2609	ELECT 47U M 6.3V
C1830	403 068 3202	CERAMIC 0.033U K 25V
C1831	403 067 9304	CERAMIC 0.01U K 25V
C1832	403 067 9304	CERAMIC 0.01U K 25V
C1833	403 067 9304	CERAMIC 0.01U K 25V
C1834	403 014 3508	CERAMIC 18P J 50V
C1835	403 067 9304	CERAMIC 0.01U K 25V
C1836	403 022 8304	CERAMIC 33P J 50V
C1837	403 043 9601	ELECT 47U M 16V
C1839	403 067 9304	CERAMIC 0.01U K 25V
C1840	403 067 9809	CERAMIC 0.1U K 25V
C1841	403 067 9809	CERAMIC 0.1U K 25V
C1842	403 067 9304	CERAMIC 0.01U K 25V
C1843	403 042 8308	ELECT 22U M 16V
C1844	403 067 9809	CERAMIC 0.1U K 25V
C1845	403 067 9809	CERAMIC 0.1U K 25V
C1846	403 042 8308	ELECT 22U M 16V
C1848	403 067 9304	CERAMIC 0.01U K 25V
C1849	403 073 7301	CERAMIC 470P K 50V
C1850	403 030 6309	CERAMIC 68P J 50V
IC181	409 000 7703	IC AN3311K
L1801	613 014 1057	HF CHOKE 5.6UH J
L1802	613 014 1057	HF CHOKE 5.6UH J
L1803	613 014 1170	HF CHOKE 56UH J
L1804	613 014 1118	HF CHOKE 18UH J

LOCATION	PARTS NO.	DESCRIPTION
L1805	613 015 6204	HF CHOKE 100UH J
L1806	613 015 6204	HF CHOKE 100UH J
L1807	613 014 1101	HF CHOKE 15UH J
Q1801	405 002 0308	TR 2SA1037K-T96-R
OR	405 002 0407	TR 2SA1037K-T96-S
OR	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q1802	405 002 0308	TR 2SA1037K-T96-R
OR	405 002 0407	TR 2SA1037K-T96-S
OR	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q1803	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4608	TR 2SC2412K-T96-S
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q1804	405 015 9701	TR 2SC2814-F4-TB
OR	405 078 0400	TR 2SC2413K-T96-P
Q1805	405 015 9701	TR 2SC2814-F4-TB
OR	405 078 0400	TR 2SC2413K-T96-P
Q1806	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4608	TR 2SC2412K-T96-S
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q1807	405 004 4601	TR 2SA608-F-SPA-AC
Q1808	405 019 2807	TR 2SC536-F-SPA-AC
Q1809	405 004 4601	TR 2SA608-F-SPA-AC
Q1810	405 019 2807	TR 2SC536-F-SPA-AC
Q1811	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4608	TR 2SC2412K-T96-S
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
R1801	401 037 5202	MT-GLAZE 100 JA 1/10W
R1802	401 039 0304	MT-GLAZE 820 JA 1/10W
R1803	401 039 0304	MT-GLAZE 820 JA 1/10W
R1804	401 037 5103	MT-GLAZE 10 JA 1/10W
R1805	401 037 5103	MT-GLAZE 10 JA 1/10W
R1806	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1807	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1808	401 039 0304	MT-GLAZE 820 JA 1/10W
R1809	401 038 2002	MT-GLAZE 270 JA 1/10W
R1810	401 039 0304	MT-GLAZE 820 JA 1/10W
R1811	401 037 5103	MT-GLAZE 10 JA 1/10W
R1812	401 037 5103	MT-GLAZE 10 JA 1/10W
R1813	401 036 1601	MT-GLAZE 2.2K JA 1/8W
R1814	401 036 1601	MT-GLAZE 2.2K JA 1/8W
R1815	401 037 8104	MT-GLAZE 150K JA 1/10W
R1816	401 037 5400	MT-GLAZE 1K JA 1/10W
R1817	401 037 5400	MT-GLAZE 1K JA 1/10W
R1818	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R1819	401 037 5202	MT-GLAZE 100 JA 1/10W
R1821	401 037 5608	MT-GLAZE 10K JA 1/10W
R1822	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R1823	401 038 0800	MT-GLAZE 22K JA 1/10W
R1824	401 037 5202	MT-GLAZE 100 JA 1/10W
R1825	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R1826	401 038 3801	MT-GLAZE 330K JA 1/10W
R1827	401 037 5400	MT-GLAZE 1K JA 1/10W
R1828	401 037 5400	MT-GLAZE 1K JA 1/10W
R1829	401 037 5608	MT-GLAZE 10K JA 1/10W
R1830	401 037 5400	MT-GLAZE 1K JA 1/10W
R1831	401 037 5400	MT-GLAZE 1K JA 1/10W
R1832	401 035 7901	MT-GLAZE 1.5K JA 1/8W
R1833	401 036 9607	MT-GLAZE 56 JA 1/8W
R1834	401 036 1700	MT-GLAZE 22K JA 1/8W
R1835	401 038 2002	MT-GLAZE 270 JA 1/10W
R1836	401 036 9607	MT-GLAZE 56 JA 1/8W
R1837	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R1838	401 037 5400	MT-GLAZE 1K JA 1/10W
R1839	401 036 1601	MT-GLAZE 2.2K JA 1/8W
R1840	401 037 5400	MT-GLAZE 1K JA 1/10W
R1841	401 038 3702	MT-GLAZE 33K JA 1/10W
R1842	401 037 8005	MT-GLAZE 15K JA 1/10W
R1843	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1844	401 037 8005	MT-GLAZE 15K JA 1/10W
R1845	401 038 3702	MT-GLAZE 33K JA 1/10W
R1846	401 038 6505	MT-GLAZE 47K JA 1/10W
R1847	401 037 5608	MT-GLAZE 10K JA 1/10W
R1848	401 037 5400	MT-GLAZE 1K JA 1/10W
R1849	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1850	401 038 6307	MT-GLAZE 470 JA 1/10W
R1851	401 038 6505	MT-GLAZE 47K JA 1/10W
R1852	401 037 5608	MT-GLAZE 10K JA 1/10W
R1853	401 037 5400	MT-GLAZE 1K JA 1/10W
R1854	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R1855	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R1856	401 038 9001	MT-GLAZE 680 JA 1/10W
R1857	401 038 6505	MT-GLAZE 47K JA 1/10W
R1858	401 037 5608	MT-GLAZE 10K JA 1/10W
R1859	401 038 0800	MT-GLAZE 22K JA 1/10W
R1860	401 037 5400	MT-GLAZE 1K JA 1/10W
R1861	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R1862	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R1863	401 037 5400	MT-GLAZE 1K JA 1/10W
R1864	401 038 0503	MT-GLAZE 22 JA 1/10W
R1865	401 038 0503	MT-GLAZE 22 JA 1/10W
R1866	401 038 2002	MT-GLAZE 270 JA 1/10W
R1867	401 038 6505	MT-GLAZE 47K JA 1/10W
R1868	401 037 5608	MT-GLAZE 10K JA 1/10W
R1869	401 038 0800	MT-GLAZE 22K JA 1/10W
R1870	401 037 5400	MT-GLAZE 1K JA 1/10W
R1871	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R1872	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R1873	401 037 5400	MT-GLAZE 1K JA 1/10W
R1874	401 038 0503	MT-GLAZE 22 JA 1/10W
R1875	401 038 0503	MT-GLAZE 22 JA 1/10W
R1876	401 037 5202	MT-GLAZE 100 JA 1/10W
R1877	401 037 8005	MT-GLAZE 15K JA 1/10W
R1880	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R1881	401 036 1601	MT-GLAZE 2.2K JA 1/8W
R1893	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
R1894	401 036 9607	MT-GLAZE 56 JA 1/8W
VR181	613 002 0369	SEMI VR 2.2KXB
VR182	613 002 0369	SEMI VR 2.2KXB
VR183	613 002 0345	SEMI VR 1KB

AUDIO PRE-AMP. CIRCUIT(AP-A)

LOCATION	PARTS NO.	DESCRIPTION
C2901	403 068 0409	CERAMIC 0.1U Z 25V
C2902	403 067 9304	CERAMIC 0.01U K 25V
C2903	403 049 0800	ELECT 1U M 50V
C2904	403 068 2007	CERAMIC 0.022U K 25V
C2905	403 009 9409	CERAMIC 100P K 50V
C2906	403 009 9409	CERAMIC 100P K 50V
C2907	403 072 1706	CERAMIC 0.022U K 50V
C2908	403 049 0800	ELECT 1U M 50V
C2909	403 067 9304	CERAMIC 0.01U K 25V
C2910	403 067 9304	CERAMIC 0.01U K 25V
C2911	403 043 4408	ELECT 33U M 16V
C2912	403 067 9304	CERAMIC 0.01U K 25V
C2913	403 067 9304	CERAMIC 0.01U K 25V
C2914	403 043 9601	ELECT 47U M 16V
C2915	403 067 9304	CERAMIC 0.01U K 25V

LOCATION	PARTS NO.	DESCRIPTION
C2916	403 041 9405	ELECT 10U M 16V
C2917	403 068 0508	CERAMIC 0.1U Z 25V
C2918	403 067 9304	CERAMIC 0.01U K 25V
C2919	403 013 1109	CERAMIC 15P K 50V
IC291	409 158 6108	IC UPC2304
L2901	613 015 6730	HF CHOKE 100UH K
L2902	613 015 6730	HF CHOKE 100UH K
L2903	613 015 6730	HF CHOKE 100UH K
Q2901	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
Q2902	405 014 4400	TR 2SC2412K-T96-Q
OR	405 014 4509	TR 2SC2412K-T96-R
R2901	401 036 1403	MT-GLAZE 220 JA 1/8W
R2902	401 037 5103	MT-GLAZE 10 JA 1/10W
R2903	401 037 5103	MT-GLAZE 10 JA 1/10W
R2904	401 038 5300	MT-GLAZE 39K JA 1/10W
R2905	401 038 7601	MT-GLAZE 560 JA 1/10W
R2906	401 038 7601	MT-GLAZE 560 JA 1/10W
R2907	401 038 5300	MT-GLAZE 39K JA 1/10W
R2908	401 038 9001	MT-GLAZE 680 JA 1/10W
R2909	401 037 5400	MT-GLAZE 1K JA 1/10W
R2910	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R2911	401 037 7909	MT-GLAZE 1.5K JA 1/10W
R2912	401 038 8509	MT-GLAZE 620 JA 1/10W
R2913	401 037 5608	MT-GLAZE 10K JA 1/10W
R2914	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R2951	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
R2952	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
R2953	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
COMPL,AD-1		
COMPL.NO.	613 088 2332	
B2201	405 018 1900	TR 2SC3395-TB
B2223	405 018 1900	TR 2SC3395-TB
B2224	405 018 1900	TR 2SC3395-TB
B2225	405 003 7207	TR 2SA1342-TB
B2241	405 018 1900	TR 2SC3395-TB
B2251	405 058 5401	TR FMC2-T98
B2252	405 018 1900	TR 2SC3395-TB
B2253	405 018 1900	TR 2SC3395-TB
B2254	405 018 1900	TR 2SC3395-TB
B2255	405 018 1900	TR 2SC3395-TB
B2256	405 018 1900	TR 2SC3395-TB
B2258	405 018 1900	TR 2SC3395-TB
B2259	405 058 5401	TR FMC2-T98
B2260	405 058 5401	TR FMC2-T98
B2262	405 018 1900	TR 2SC3395-TB
B2263	405 018 1900	TR 2SC3395-TB
B2264	405 018 1900	TR 2SC3395-TB
B2265	405 018 1900	TR 2SC3395-TB
B2422	405 018 1900	TR 2SC3395-TB
C2201	403 042 3006	ELECT 100U M 16V
C2221	403 041 9405	ELECT 10U M 16V
C2222	403 039 2609	ELECT 47U M 6.3V
C2223	403 069 5700	CERAMIC 0.01U K 50V
C2224	403 111 8000	CERAMIC 1200P J 50V
C2225	403 018 7502	CERAMIC 220P J 50V
C2226	403 069 5700	CERAMIC 0.01U K 50V
C2227	403 041 2703	ELECT 47U M 10V
C2228	403 040 2209	ELECT 22U M 10V
C2229	403 024 7206	CERAMIC 390P J 50V
C2230	403 072 1706	CERAMIC 0.022U K 50V
C2231	403 050 0509	ELECT 2.2U M 50V

LOCATION	PARTS NO.	DESCRIPTION
C2233	403 041 9405	ELECT 10U M 16V
C2234	403 069 5700	CERAMIC 0.01U K 50V
C2235	403 043 9601	ELECT 47U M 16V
C2236	403 039 2609	ELECT 47U M 6.3V
C2237	403 069 5700	CERAMIC 0.01U K 50V
C2238	403 039 2609	ELECT 47U M 6.3V
C2239	403 069 5700	CERAMIC 0.01U K 50V
C2251	403 071 2902	CERAMIC 1800P K 50V
C2252	403 041 9405	ELECT 10U M 16V
C2253	403 047 0604	ELECT 4.7U M 25V
C2254	403 039 2609	ELECT 47U M 6.3V
C2255	403 003 4707	CERAMIC 0.027U J 25V
C2256	403 074 1902	CERAMIC 0.047U K 50V
C2257	403 069 5700	CERAMIC 0.01U K 50V
C2258	403 041 9405	ELECT 10U M 16V
C2259	403 018 7502	CERAMIC 220P J 50V
C2260	403 081 7409	POLYPRO 0.033U J 100V
C2261	403 047 1007	ELECT 4.7U M 25V
C2262	403 069 5700	CERAMIC 0.01U K 50V
C2263	403 069 5700	CERAMIC 0.01U K 50V
C2264	403 070 1005	CERAMIC 0.1U K 50V
C2265	403 033 9208	CERAMIC 820P J 50V
C2266	403 033 9208	CERAMIC 820P J 50V
C2267	403 049 1401	ELECT 1U M 50V
C2268	403 010 1102	CERAMIC 1000P J 50V
C2269	403 003 0600	CERAMIC 0.018U K 25V
C2270	403 038 9005	ELECT 33U M 6.3V
C2271	403 049 0800	ELECT 1U M 50V
C2272	403 048 6902	ELECT 0.47U M 50V
C2273	403 001 6109	CERAMIC 2700P K 16V
C2274	403 046 2104	ELECT 3.3U M 25V
C2275	403 043 9601	ELECT 47U M 16V
C2276	403 068 0409	CERAMIC 0.1U Z 25V
C2277	403 070 1005	CERAMIC 0.1U K 50V
C2278	403 070 1005	CERAMIC 0.1U K 50V
C2279	403 074 7607	CERAMIC 5600P K 50V
C2301	403 023 4503	CERAMIC 330P J 50V
C2302	403 047 0604	ELECT 4.7U M 25V
C2303	403 059 5109	POLYESTER 0.022U J 50V
C2304	403 041 9405	ELECT 10U M 16V
C2305	403 060 7505	POLYESTER 0.033U J 50V
C2306	403 041 2703	ELECT 47U M 10V
C2307	403 056 9605	POLYESTER 0.01U J 50V
C2309	403 073 0005	CERAMIC 3300P K 50V
C2311	403 020 7309	CERAMIC 2700P J 50V
C2312	403 013 5909	CERAMIC 1500P J 50V
C2313	403 018 7502	CERAMIC 220P J 50V
C2321	403 047 0604	ELECT 4.7U M 25V
C2322	403 038 5403	ELECT 22U M 6.3V
C2323	403 009 5807	CERAMIC 100P J 50V
C2324	403 069 5700	CERAMIC 0.01U K 50V
C2325	403 030 7009	CERAMIC 68P J 50V
C2326	403 014 9302	CERAMIC 180P J 50V
C2327	403 020 5602	CERAMIC 270P J 50V
C2328	403 069 5700	CERAMIC 0.01U K 50V
C2329	403 023 4503	CERAMIC 330P J 50V
C2330	403 047 0604	ELECT 4.7U M 25V
C2332	403 071 8102	CERAMIC 2200P K 50V
C2341	403 075 0805	CERAMIC 6800P K 50V
C2342	403 041 9405	ELECT 10U M 16V
C2343	403 072 1706	CERAMIC 0.022U K 50V
C2344	403 014 9609	CERAMIC 180P J 50V
C2345	403 069 5700	CERAMIC 0.01U K 50V
C2401	403 023 4503	CERAMIC 330P J 50V
C2402	403 047 0604	ELECT 4.7U M 25V
C2403	403 059 5109	POLYESTER 0.022U J 50V
C2404	403 041 9405	ELECT 10U M 16V
C2405	403 060 7505	POLYESTER 0.033U J 50V
C2406	403 041 2703	ELECT 47U M 10V

LOCATION	PARTS NO.	DESCRIPTION
C2407	403 056 9605	POLYESTER 0.01U J 50V
C2408	403 041 2703	ELECT 47U M 10V
C2409	403 073 0005	CERAMIC 3300P K 50V
C2411	403 020 7309	CERAMIC 2700P J 50V
C2412	403 013 5909	CERAMIC 1500P J 50V
C2413	403 018 7908	CERAMIC 220P J 50V
C2421	403 047 0604	ELECT 4.7U M 25V
C2422	403 038 5403	ELECT 22U M 6.3V
C2423	403 009 5807	CERAMIC 100P J 50V
C2424	403 069 5700	CERAMIC 0.01U K 50V
C2425	403 030 7009	CERAMIC 68P J 50V
C2426	403 009 5807	CERAMIC 100P J 50V
C2427	403 014 9302	CERAMIC 180P J 50V
C2428	403 069 5700	CERAMIC 0.01U K 50V
C2429	403 023 4503	CERAMIC 330P J 50V
C2430	403 047 0604	ELECT 4.7U M 25V
C2432	403 071 8102	CERAMIC 2200P K 50V
C2435	403 011 5000	CERAMIC 120P J 50V
C2436	403 011 5000	CERAMIC 120P J 50V
C2441	403 075 0805	CERAMIC 6800P K 50V
C2442	403 041 9405	ELECT 10U M 16V
C2443	403 072 1706	CERAMIC 0.022U K 50V
C2444	403 014 9302	CERAMIC 180P J 50V
C2445	403 069 5700	CERAMIC 0.01U K 50V
D2201	407 003 3609	DIODE DAN202K-T-96
D2221	407 003 3609	DIODE DAN202K-T-96
D2241	407 003 3609	DIODE DAN202K-T-96
D2251	407 003 3609	DIODE DAN202K-T-96
D2252	407 003 3609	DIODE DAN202K-T-96
D2253	407 003 3609	DIODE DAN202K-T-96
D2254	407 003 3609	DIODE DAN202K-T-96
IC221	409 155 3001	IC LA7250
IC222	409 036 8002	IC M5228P
IC223	409 158 5903	IC UPC2307GH
IC224	409 036 8804	IC M5278L05-01
IC225	409 133 1401	IC LA7294
IC231	409 039 7408	IC NJM4558D
IC241	409 039 7408	IC NJM4558D
J2201	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2202	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2203	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2204	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2206	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2207	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2208	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2209	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2211	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2212	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2213	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2214	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2215	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2217	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2218	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2221	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2222	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2230	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2231	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2232	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2233	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2234	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2235	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2236	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2237	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2239	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2240	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2241	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2242	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2300	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2301	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
L2251	613 015 6075	HF CHOKE 7MH
L2252	613 015 0790	HF CHOKE 560UH
L2253	613 078 3936	COIL.INDUCTOR 182U
L2254	613 017 0316	CORE
L2255	613 017 0316	CORE
L2321	613 014 1200	HF CHOKE 100UH J
L2322	613 014 5802	HF CHOKE 120UH J
L2421	613 014 1200	HF CHOKE 100UH J
L2422	613 014 1200	HF CHOKE 100UH J
Q2221	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q2222	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q2223	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q2251	405 024 9709	TR 2SD734-E-AA
OR	405 024 9907	TR 2SD734-F-AA
Q2341	405 027 1403	TR 2SK303-V3-TB
OR	405 045 5407	TR 2SK303-V4-TB
Q2441	405 027 1403	TR 2SK303-V3-TB
OR	405 045 5407	TR 2SK303-V4-TB
R2221	401 038 7809	MT-GLAZE 56K JA 1/10W
R2222	401 037 7404	MT-GLAZE 13K JA 1/10W
R2223	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2224	401 037 5608	MT-GLAZE 10K JA 1/10W
R2225	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2227	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2228	401 037 5400	MT-GLAZE 1K JA 1/10W
R2229	401 038 2002	MT-GLAZE 270 JA 1/10W
R2230	401 037 5202	MT-GLAZE 100 JA 1/10W
R2231	401 037 5202	MT-GLAZE 100 JA 1/10W
R2232	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2233	401 039 1004	MT-GLAZE 9.1K JA 1/10W
R2234	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2235	401 037 6100	MT-GLAZE 1.1K JA 1/10W
R2236	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2237	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R2241	401 038 0800	MT-GLAZE 22K JA 1/10W
R2251	401 037 5608	MT-GLAZE 10K JA 1/10W
R2252	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R2253	401 039 1004	MT-GLAZE 9.1K JA 1/10W
R2254	401 037 5608	MT-GLAZE 10K JA 1/10W
R2255	401 038 2408	MT-GLAZE 2.7M JA 1/10W
R2256	401 038 3702	MT-GLAZE 33K JA 1/10W
R2257	401 037 8005	MT-GLAZE 15K JA 1/10W
R2258	401 038 4105	MT-GLAZE 3.6K JA 1/10W
R2259	401 039 0304	MT-GLAZE 820 JA 1/10W
R2260	401 037 9309	MT-GLAZE 18K JA 1/10W
R2261	401 014 5102	CARBON 15K JA 1/4W
R2262	401 019 9501	CARBON 47 JA 1/4W
R2263	401 019 6104	CARBON 4.7 JA 1/4W
R2264	401 023 0600	CARBON 82 JA 1/4W
R2265	401 037 5202	MT-GLAZE 100 JA 1/10W
R2266	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2267	401 037 6605	MT-GLAZE 120 JA 1/10W
R2268	401 038 8608	MT-GLAZE 6.2K JA 1/10W
R2269	401 038 5409	MT-GLAZE 390K JA 1/10W
R2270	401 039 0205	MT-GLAZE 82 JA 1/10W
R2271	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R2272	401 037 5608	MT-GLAZE 10K JA 1/10W
R2273	401 038 0800	MT-GLAZE 22K JA 1/10W
R2274	401 037 5608	MT-GLAZE 10K JA 1/10W
R2275	401 037 5608	MT-GLAZE 10K JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
R2276	401 038 6505	MT-GLAZE 47K JA 1/10W
R2277	401 038 0800	MT-GLAZE 22K JA 1/10W
R2278	401 038 0800	MT-GLAZE 22K JA 1/10W
R2279	401 037 5608	MT-GLAZE 10K JA 1/10W
R2280	401 037 5608	MT-GLAZE 10K JA 1/10W
R2281	401 037 8005	MT-GLAZE 15K JA 1/10W
R2282	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2283	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R2284	401 038 7809	MT-GLAZE 56K JA 1/10W
R2285	401 037 5707	MT-GLAZE 100K JA 1/10W
R2286	401 037 5707	MT-GLAZE 100K JA 1/10W
R2287	401 038 0800	MT-GLAZE 22K JA 1/10W
R2288	401 037 5608	MT-GLAZE 10K JA 1/10W
R2301	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R2302	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2303	401 037 5608	MT-GLAZE 10K JA 1/10W
R2304	401 037 6100	MT-GLAZE 1.1K JA 1/10W
R2305	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2306	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2307	401 037 5608	MT-GLAZE 10K JA 1/10W
R2308	401 038 4105	MT-GLAZE 3.6K JA 1/10W
R2309	401 038 0107	MT-GLAZE 2K JA 1/10W
R2310	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2311	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2312	401 039 1004	MT-GLAZE 9.1K JA 1/10W
R2313	401 039 1004	MT-GLAZE 9.1K JA 1/10W
R2314	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2315	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2316	401 037 5608	MT-GLAZE 10K JA 1/10W
R2321	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R2322	401 114 5804	MT-FILM 2.7K FD 1/6W
R2323	401 037 5400	MT-GLAZE 1K JA 1/10W
R2324	401 039 0304	MT-GLAZE 820 JA 1/10W
R2325	401 037 9101	MT-GLAZE 180 JA 1/10W
R2326	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2327	401 037 5400	MT-GLAZE 1K JA 1/10W
R2328	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R2341	401 038 6604	MT-GLAZE 470K JA 1/10W
R2342	401 037 5707	MT-GLAZE 100K JA 1/10W
R2343	401 038 0800	MT-GLAZE 22K JA 1/10W
R2344	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R2345	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2346	401 038 0602	MT-GLAZE 220 JA 1/10W
R2401	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2402	401 035 6102	MT-GLAZE 1.1K JA 1/8W
R2403	401 037 5608	MT-GLAZE 10K JA 1/10W
R2404	401 037 6100	MT-GLAZE 1.1K JA 1/10W
R2405	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2406	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2407	401 037 5608	MT-GLAZE 10K JA 1/10W
R2408	401 038 4105	MT-GLAZE 3.6K JA 1/10W
R2409	401 038 0107	MT-GLAZE 2K JA 1/10W
R2410	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2411	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2412	401 039 1004	MT-GLAZE 9.1K JA 1/10W
R2413	401 039 1004	MT-GLAZE 9.1K JA 1/10W
R2414	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2415	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2416	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2421	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R2422	401 087 3708	MT-FILM 2.2K FD 1/6W
R2423	401 037 5400	MT-GLAZE 1K JA 1/10W
R2424	401 038 5805	MT-GLAZE 430 JA 1/10W
R2425	401 038 7601	MT-GLAZE 560 JA 1/10W
R2426	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R2427	401 037 5400	MT-GLAZE 1K JA 1/10W
R2428	401 037 6704	MT-GLAZE 1.2K JA 1/10W
R2429	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2441	401 038 6604	MT-GLAZE 470K JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
R2442	401 037 5707	MT-GLAZE 100K JA 1/10W
R2443	401 038 0800	MT-GLAZE 22K JA 1/10W
R2444	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R2445	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R2446	401 038 0602	MT-GLAZE 220 JA 1/10W
R2447	401 038 0800	MT-GLAZE 22K JA 1/10W
R2448	401 038 0800	MT-GLAZE 22K JA 1/10W
RY221	613 078 3981	RELAY,1-2
T2251	613 016 2205	OSC COIL 70KHZ
VR221	613 002 0376	SEMI VR 3.3KB
VR222	613 002 0482	SEMI VR 220KB
VR223	613 002 0406	SEMI VR 10KB
VR224	613 002 0406	SEMI VR 10KB
VR231	613 001 8618	SEMI VR 10KB
VR232	613 001 9004	SEMI VR 3.3KB
VR233	613 001 8571	SEMI VR 1KB
VR241	613 001 8618	SEMI VR 10KB
VR242	613 001 9004	SEMI VR 3.3KB
VR243	613 001 8571	SEMI VR 1KB
XF231	613 088 9430	FILTER
XF241	613 088 9447	FILTER

COMPL,AD-2

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 088 2349	
B2001	405 083 5209	TR DTC343TK T96
B2002	405 083 5209	TR DTC343TK T96
B2003	405 083 5100	TR DTC341TK T96
B2051	405 083 5209	TR DTC343TK T96
B2052	405 083 5209	TR DTC343TK T96
B2053	405 083 5100	TR DTC341TK T96
B2102	405 018 1900	TR 2SC3395-TB
B2103	405 058 5401	TR FMC2-T98
B2104	405 018 1900	TR 2SC3395-TB
B2105	405 003 7207	TR 2SA1342-TB
B2106	405 058 5401	TR FMC2-T98
B2107	405 018 1900	TR 2SC3395-TB
B2109	405 058 5401	TR FMC2-T98
B2110	405 058 5401	TR FMC2-T98
B2111	405 018 1900	TR 2SC3395-TB
B2112	405 018 1900	TR 2SC3395-TB
B2113	405 018 1900	TR 2SC3395-TB
B2115	405 018 1900	TR 2SC3395-TB
B2117	405 018 1900	TR 2SC3395-TB
B2118	405 083 5100	TR DTC341TK T96
B2130	405 018 1900	TR 2SC3395-TB
C2001	403 041 8804	ELECT 10U M 16V
C2002	403 041 8804	ELECT 10U M 16V
C2003	403 041 8804	ELECT 10U M 16V
C2004	403 070 2705	CERAMIC 0.1U Z 50V
C2005	403 040 7501	ELECT 33U M 10V
C2006	403 041 9405	ELECT 10U M 16V
C2007	403 039 7307	ELECT 100U M 10V
C2008	403 049 0008	ELECT 1U M 50V
C2051	403 041 8804	ELECT 10U M 16V
C2052	403 041 8804	ELECT 10U M 16V
C2053	403 041 8804	ELECT 10U M 16V
C2054	403 070 2705	CERAMIC 0.1U Z 50V
C2055	403 040 7501	ELECT 33U M 10V
C2056	403 041 9405	ELECT 10U M 16V
C2057	403 039 7307	ELECT 100U M 10V
C2058	403 049 0800	ELECT 1U M 50V
C2060	403 040 9406	ELECT 330U M 10V
C2101	403 041 9405	ELECT 10U M 16V

LOCATION	PARTS NO.	DESCRIPTION
C2102	403 041 8804	ELECT 10U M 16V
C2103	403 039 6508	ELECT 100U M 10V
C2104	403 042 8308	ELECT 22U M 16V
C2105	403 046 2104	ELECT 3.3U M 25V
C2106	403 043 9601	ELECT 47U M 16V
C2108	403 041 8804	ELECT 10U M 16V
C2109	403 041 8804	ELECT 10U M 16V
C2110	403 049 0008	ELECT 1U M 50V
C2111	403 040 1707	ELECT 22U M 10V
C2112	403 046 9905	ELECT 4.7U M 25V
C2113	403 068 3707	CERAMIC 0.33U Z 25V
C2114	403 068 3202	CERAMIC 0.033U K 25V
C2121	403 039 6508	ELECT 100U M 10V
C2144	403 050 7102	ELECT 3.3U M 50V
D2101	407 003 3609	DIODE DAN202K-T-96
D2102	407 051 4801	ZENER DIODE GZS2.0X-BT
D2103	407 003 4507	DIODE DAP202K-T-96
D2104	407 003 3609	DIODE DAN202K-T-96
D2105	407 003 3609	DIODE DAN202K-T-96
D2108	407 003 3609	DIODE DAN202K-T-96
D2109	407 003 3609	DIODE DAN202K-T-96
D2110	407 003 3609	DIODE DAN202K-T-96
D2111	407 003 5108	DIODE DA204K-T96
D2112	407 003 4507	DIODE DAP202K-T-96
D2114	407 003 3609	DIODE DAN202K-T-96
D2130	407 003 3609	DIODE DAN202K-T-96
D2146	407 003 3609	DIODE DAN202K-T-96
IC211	409 155 3100	IC LA7237
IC212	409 158 6207	IC M5222P
IC213	409 039 7101	IC NJM4556D
IC214	409 036 8309	IC M5236L
IC215	409 155 3100	IC LA7237
IC216	409 158 6009	IC BX7599
J2101	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2102	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2103	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2104	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2105	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2106	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2107	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2108	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2109	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2110	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2111	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2114	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J2151	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2157	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2158	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2160	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2161	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2163	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2165	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2170	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2171	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2173	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2174	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2175	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J2181	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
Q2101	405 007 6701	TR 2SB598-F-NP-AA
Q2102	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q2103	405 002 6508	TR 2SA1179-M5-TB
OR	405 002 6706	TR 2SA1179-M6-TB
Q2104	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB

LOCATION	PARTS NO.	DESCRIPTION
Q2105	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q2107	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
R2001	401 038 1401	MT-GLAZE 24K JA 1/10W
R2002	401 037 5806	MT-GLAZE 1M JA 1/10W
R2003	401 038 1401	MT-GLAZE 24K JA 1/10W
R2004	401 037 5806	MT-GLAZE 1M JA 1/10W
R2005	401 038 2200	MT-GLAZE 27K JA 1/10W
R2006	401 037 5806	MT-GLAZE 1M JA 1/10W
R2009	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R2010	401 038 0602	MT-GLAZE 220 JA 1/10W
R2011	401 037 5707	MT-GLAZE 100K JA 1/10W
R2012	401 038 3702	MT-GLAZE 33K JA 1/10W
R2013	401 038 7809	MT-GLAZE 56K JA 1/10W
R2014	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2015	401 037 5608	MT-GLAZE 10K JA 1/10W
R2016	401 038 7502	MT-GLAZE 56 JA 1/10W
R2017	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R2019	401 037 5400	MT-GLAZE 1K JA 1/10W
R2021	401 037 5707	MT-GLAZE 100K JA 1/10W
R2022	401 037 5707	MT-GLAZE 100K JA 1/10W
R2023	401 037 5707	MT-GLAZE 100K JA 1/10W
R2051	401 038 1401	MT-GLAZE 24K JA 1/10W
R2052	401 037 5806	MT-GLAZE 1M JA 1/10W
R2053	401 038 1401	MT-GLAZE 24K JA 1/10W
R2054	401 037 5806	MT-GLAZE 1M JA 1/10W
R2055	401 038 2200	MT-GLAZE 27K JA 1/10W
R2056	401 037 5806	MT-GLAZE 1M JA 1/10W
R2059	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R2060	401 038 0602	MT-GLAZE 220 JA 1/10W
R2061	401 037 5707	MT-GLAZE 100K JA 1/10W
R2062	401 038 3702	MT-GLAZE 33K JA 1/10W
R2063	401 038 7809	MT-GLAZE 56K JA 1/10W
R2064	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2065	401 037 5608	MT-GLAZE 10K JA 1/10W
R2066	401 038 7502	MT-GLAZE 56 JA 1/10W
R2067	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R2069	401 037 5400	MT-GLAZE 1K JA 1/10W
R2071	401 037 5707	MT-GLAZE 100K JA 1/10W
R2072	401 037 5707	MT-GLAZE 100K JA 1/10W
R2073	401 037 5707	MT-GLAZE 100K JA 1/10W
R2101	401 037 5400	MT-GLAZE 1K JA 1/10W
R2102	401 038 3702	MT-GLAZE 33K JA 1/10W
R2103	401 038 0800	MT-GLAZE 22K JA 1/10W
R2104	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2105	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2106	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R2107	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2108	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2111	401 038 3108	MT-GLAZE 30K JA 1/10W
R2112	401 038 3108	MT-GLAZE 30K JA 1/10W
R2113	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R2114	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R2118	401 037 8005	MT-GLAZE 15K JA 1/10W
R2119	401 037 8005	MT-GLAZE 15K JA 1/10W
R2120	401 038 0602	MT-GLAZE 220 JA 1/10W
R2121	401 038 3702	MT-GLAZE 33K JA 1/10W
R2122	401 038 5904	MT-GLAZE 4.3K JA 1/10W
R2123	401 037 8005	MT-GLAZE 15K JA 1/10W
R2124	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2125	401 038 7403	MT-GLAZE 510K JA 1/10W
R2126	401 038 2200	MT-GLAZE 27K JA 1/10W
R2127	401 038 6307	MT-GLAZE 470 JA 1/10W
R2128	401 037 5608	MT-GLAZE 10K JA 1/10W
R2129	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R2130	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R2131	401 038 1005	MT-GLAZE 2.2M JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
R2132	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R2133	401 037 5400	MT-GLAZE 1K JA 1/10W
R2135	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R2138	401 038 0800	MT-GLAZE 22K JA 1/10W
R2160	401 037 5608	MT-GLAZE 10K JA 1/10W
R2161	401 038 0800	MT-GLAZE 22K JA 1/10W
R2180	401 037 9200	MT-GLAZE 1.8K JA 1/10W

COMPL,SY-2

COMPL.NO.	613 082 0563	
B3803	405 018 1900	TR 2SC3395-TB
B3804	405 018 1900	TR 2SC3395-TB
B3805	405 018 1900	TR 2SC3395-TB
B3806	405 018 1900	TR 2SC3395-TB
C3181	403 118 0106	NP-ELECT 10U M 16V
C3182	403 069 1702	CERAMIC 1000P K 50V
C3183	403 068 0409	CERAMIC 0.1U Z 25V
C3186	403 068 0409	CERAMIC 0.1U Z 25V
C3801	403 069 9500	CERAMIC 0.01U Z 50V
C3802	403 043 9601	ELECT 47U M 16V
C3803	403 068 0409	CERAMIC 0.1U Z 25V
C3804	403 069 5601	CERAMIC 0.01U K 50V
C3805	403 069 5601	CERAMIC 0.01U K 50V
C3806	403 012 6808	CERAMIC 15P J 50V
C3807	403 022 2609	CERAMIC 30P J 50V
C3808	403 069 5601	CERAMIC 0.01U K 50V
C3809	403 019 5101	CERAMIC 240P J 50V
C3810	403 043 9601	ELECT 47U M 16V
C3811	403 069 5601	CERAMIC 0.01U K 50V
C3812	403 069 5601	CERAMIC 0.01U K 50V
C3813	403 069 5601	CERAMIC 0.01U K 50V
C3815	403 069 5601	CERAMIC 0.01U K 50V
D3181	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D3804	407 003 3609	DIODE DAN202K-T-96
IC304	409 163 0306	IC LC6521H-3786
IC381	409 157 6505	IC M50927-650SP
L3801	613 014 1200	HF CHOKE 100UH J
L3802	613 015 6730	HF CHOKE 100UH K
L3803	613 014 1118	HF CHOKE 18UH J
L3804	613 015 6259	HF CHOKE 270UH J
L3805	613 014 1101	HF CHOKE 15UH J
Q3181	405 014 4509	TR 2SC2412K-T96-R
OR	405 014 4608	TR 2SC2412K-T96-S
Q3801	405 014 4509	TR 2SC2412K-T96-R
OR	405 015 8407	TR 2SC2812-L5-TB
Q3802	405 015 9701	TR 2SC2814-F4-TB
OR	405 015 9909	TR 2SC2814-F5-TB
OR	405 078 0400	TR 2SC2413K-T96-P
OR	405 035 6100	TR 2SC2413K-T96-Q
Q3803	405 015 9701	TR 2SC2814-F4-TB
OR	405 015 9909	TR 2SC2814-F5-TB
OR	405 078 0400	TR 2SC2413K-T96-P
OR	405 035 6100	TR 2SC2413K-T96-Q
Q3804	405 014 4509	TR 2SC2412K-T96-R
OR	405 015 8407	TR 2SC2812-L5-TB
Q3805	405 014 4509	TR 2SC2412K-T96-R
OR	405 015 8902	TR 2SC2812-L7-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 014 4608	TR 2SC2412K-T96-S
R3181	401 038 6505	MT-GLAZE 47K JA 1/10W
R3182	401 038 3702	MT-GLAZE 33K JA 1/10W

LOCATION	PARTS NO.	DESCRIPTION
R3183	401 037 8203	MT-GLAZE 1.5M JA 1/10W
R3184	401 038 0800	MT-GLAZE 22K JA 1/10W
R3185	401 037 5400	MT-GLAZE 1K JA 1/10W
R3189	401 037 5608	MT-GLAZE 10K JA 1/10W
R3190	401 035 5204	MT-GLAZE 10K JA 1/8W
R3191	401 037 5400	MT-GLAZE 1K JA 1/10W
R3192	401 037 5400	MT-GLAZE 1K JA 1/10W
R3193	401 037 5400	MT-GLAZE 1K JA 1/10W
R3194	401 037 5608	MT-GLAZE 10K JA 1/10W
R3197	401 012 5609	CARBON 1K JA 1/4W
R3198	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3801	401 037 5400	MT-GLAZE 1K JA 1/10W
R3802	401 037 5400	MT-GLAZE 1K JA 1/10W
R3803	401 038 6604	MT-GLAZE 470K JA 1/10W
R3804	401 037 5400	MT-GLAZE 1K JA 1/10W
R3805	401 038 6604	MT-GLAZE 470K JA 1/10W
R3808	401 037 5608	MT-GLAZE 10K JA 1/10W
R3809	401 037 5608	MT-GLAZE 10K JA 1/10W
R3812	401 037 5608	MT-GLAZE 10K JA 1/10W
R3813	401 037 5608	MT-GLAZE 10K JA 1/10W
R3815	401 037 5608	MT-GLAZE 10K JA 1/10W
R3816	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3818	401 037 5400	MT-GLAZE 1K JA 1/10W
R3819	401 037 5806	MT-GLAZE 1M JA 1/10W
R3820	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3821	401 038 6604	MT-GLAZE 470K JA 1/10W
R3822	401 012 5609	CARBON 1K JA 1/4W
R3823	401 037 5608	MT-GLAZE 10K JA 1/10W
R3825	401 038 6604	MT-GLAZE 470K JA 1/10W
R3826	401 037 5400	MT-GLAZE 1K JA 1/10W
R3828	401 037 5608	MT-GLAZE 10K JA 1/10W
R3829	401 037 5608	MT-GLAZE 10K JA 1/10W
R3830	401 037 5608	MT-GLAZE 10K JA 1/10W
R3831	401 038 6604	MT-GLAZE 470K JA 1/10W
R3832	401 037 5400	MT-GLAZE 1K JA 1/10W
R3833	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R3834	401 037 5400	MT-GLAZE 1K JA 1/10W
R3835	401 037 5400	MT-GLAZE 1K JA 1/10W
R3836	401 038 6604	MT-GLAZE 470K JA 1/10W
R3837	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3838	401 038 3702	MT-GLAZE 33K JA 1/10W
R3839	401 038 0909	MT-GLAZE 220K JA 1/10W
R3841	401 038 0909	MT-GLAZE 220K JA 1/10W
R3842	401 038 2200	MT-GLAZE 27K JA 1/10W
R3843	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R3845	401 037 5608	MT-GLAZE 10K JA 1/10W
R3846	401 038 0602	MT-GLAZE 220 JA 1/10W
R3847	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3848	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R3849	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R3850	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R3851	401 037 6803	MT-GLAZE 12K JA 1/10W
R3852	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R3853	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3854	401 037 5400	MT-GLAZE 1K JA 1/10W
R3855	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R3856	401 037 5400	MT-GLAZE 1K JA 1/10W
R3857	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R3858	401 038 6307	MT-GLAZE 470 JA 1/10W
R3859	401 038 3801	MT-GLAZE 330K JA 1/10W
R3860	401 038 3702	MT-GLAZE 33K JA 1/10W
R3864	401 038 6406	MT-GLAZE 4.7K JA 1/10W
R3865	401 038 6604	MT-GLAZE 470K JA 1/10W
XF302	613 082 3557	RESONATOR,CERAMIC 4.0MHZ
XF381	613 079 7414	CERAMIC RESONATOR 4MHZ

COMPL,PW-1

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 088 8709	
	613 052 5543	FUSE HOLDER,F5001
B5101	405 003 7603	TR 2SA1345-AC
OR	405 000 2205	TR DTA144ES-DCTP
C5001 ⚠	404 039 6703	MT-POLYPRO 0.22U K 250V
OR ⚠	404 040 8901	MT-POLYEST 0.22U M 250V
C5002 ⚠	404 039 6505	MT-POLYPRO 0.1U K 250V
OR ⚠	404 040 9007	MT-POLYEST 0.068U M 250V
C5003 ⚠	404 034 6302	CERAMIC 1000P K 400V
OR ⚠	404 034 7200	CERAMIC 1000P M 400V
C5004 ⚠	404 034 7200	CERAMIC 1000P M 400V
OR ⚠	404 034 6302	CERAMIC 1000P K 400V
C5005 ⚠	404 032 6304	CERAMIC 2200P M 400V
OR ⚠	404 034 7507	CERAMIC 2200P M 400V
C5006 ⚠	404 032 6304	CERAMIC 2200P M 400V
OR ⚠	404 034 7507	CERAMIC 2200P M 400V
C5007	404 038 5103	ELECT 82U M 400V
OR	404 036 2500	ELECT 82U M 400V
C5008	404 033 1704	CERAMIC 680P K 2K
C5009	403 137 4604	MT-POLYEST 0.047U K 630V
C5010	403 093 9606	OS-SOLID 1U M 16V
C5011	403 058 3106	POLYESTER 0.015U J 50V
C5012	403 060 2203	POLYESTER 0.027U J 50V
C5013	403 159 7508	ELECT 22U M 10V
C5015	403 072 9405	CERAMIC 3300P K 50V
C5021	403 076 6707	CERAMIC 1000P K 1K
C5022	403 076 6707	CERAMIC 1000P K 1K
C5101	403 121 6607	ELECT 47U M 50V
OR	403 154 8302	ELECT 47U M 50V
C5102	403 094 3405	OS-SOLID 100U M 20V
C5103	403 146 7504	ELECT 100U M 25V
OR	403 126 4608	ELECT 100U M 25V
C5104	403 165 5703	ELECT 2200U M 16V
C5105	403 121 6607	ELECT 47U M 50V
OR	403 154 8302	ELECT 47U M 50V
C5106	403 136 0300	ELECT 4.7U M 50V
OR	403 156 9208	ELECT 4.7U M 50V
C5107	403 148 0107	ELECT 1000U M 16V
OR	403 160 5807	ELECT 1000U M 16V
C5108	403 136 0300	ELECT 4.7U M 50V
OR	403 156 9208	ELECT 4.7U M 50V
C5109	403 160 4909	ELECT 470U M 10V
OR	403 147 9903	ELECT 470U M 10V
C5110	403 160 2400	ELECT 330U M 6.3V
OR	403 155 5508	ELECT 330U M 6.3V
C5111	403 148 0107	ELECT 1000U M 16V
OR	403 160 5807	ELECT 1000U M 16V
C5112	403 057 2902	POLYESTER 0.1U K 50V
C5113	403 057 2902	POLYESTER 0.1U K 50V
D5001	407 091 6704	DIODE AP01C-V0
D5002	407 078 2705	DIODE 1SS244-T-77
D5003	407 078 2705	DIODE 1SS244-T-77
D5004	407 097 0300	PHOTO COUPLE PC113A
D5021	407 091 7107	DIODE LB156
D5101	407 100 6909	DIODE AG01-V2
D5102	407 097 5800	DIODE FMU-G2YXS
D5103	407 100 6909	DIODE AG01-V2
D5104	407 097 5800	DIODE FMU-G2YXS
D5105	407 100 6909	DIODE AG01-V2
D5106	407 100 6909	DIODE AG01-V2
D5107	407 078 1104	ZENER DIODE MTZ33A-T-77
D5108	407 007 9904	DIODE GMA01-BT
D5109	407 053 7206	ZENER DIODE MTZ6.2C-T-77

LOCATION	PARTS NO.	DESCRIPTION
F5001 ⚠	423 005 4901	FUSE 250V 1.6A
IC501	409 149 6803	IC STK73605
IC511	409 067 7203	IC L5431-AA
L5001 ⚠	613 088 9966	LF CHOKE
L5101	613 017 0392	CORE
L5102	613 015 8178	CHOKE COIL 10UH K
L5103	613 017 0392	CORE
L5104	613 017 0392	CORE
Q5001	405 019 2005	TR 2SC536-E-SPA-AC
Q5101	405 006 6702	TR 2SA984-F-AA
Q5102	405 016 9601	TR 2SC3070-AE
R5001	401 019 3905	CARBON 390K JA 1/4W
R5002	401 019 3905	CARBON 390K JA 1/4W
R5003	401 019 3905	CARBON 390K JA 1/4W
R5004	401 019 3905	CARBON 390K JA 1/4W
R5005	401 058 1108	OXIDE-MT 10 JA 1W
R5006	401 067 7207	OXIDE-MT 33K JA 2W
R5007	401 060 2704	OXIDE-MT 220 JA 1W
R5008	401 021 1807	CARBON 560 JA 1/4W
R5010	402 035 3801	RESISTER 0.47 KB 2W
R5011	401 067 7207	OXIDE-MT 33K JA 2W
R5012	401 021 1807	CARBON 560 JA 1/4W
R5022	401 001 8000	SOLID 2.7M MA 1/2W
OR	401 001 7904	SOLID 2.7M KA 1/2W
R5101	401 021 1807	CARBON 560 JA 1/4W
R5102	401 018 2701	CARBON 330 JA 1/4W
R5103	401 103 5402	MT-FILM 6.34K FD 1/6W
R5104	401 096 4901	MT-FILM 1.5K FD 1/6W
R5105	401 021 8905	CARBON 6.2K JA 1/4W
R5106 ⚠	402 035 5706	FUSIBLE RES 3.9 JA 1/4W
R5107	401 013 6308	CARBON 12K JA 1/4W
R5108	401 021 2903	CARBON 5.6K JA 1/4W
R5109	401 020 1907	CARBON 4.7K JA 1/4W
R5110	401 017 3709	CARBON 270K JA 1/4W
R5111 ⚠	402 023 2106	FUSIBLE RES 47 JA 1/4W
T5001 ⚠	613 089 3079	TRANS,SW

COMPL,PW-2

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 088 8716	
C5201	403 121 9509	CERAMIC 0.1U Z 50V
C5202	403 155 5607	ELECT 220U M 10V
OR	403 146 6408	ELECT 220U M 10V
C5203	403 121 9509	CERAMIC 0.1U Z 50V
C5204	403 159 4606	ELECT 100U M 16V
OR	403 126 4509	ELECT 100U M 16V
C5205	403 155 5607	ELECT 220U M 10V
OR	403 146 6408	ELECT 220U M 10V
C5206	403 121 9509	CERAMIC 0.1U Z 50V
C5207	403 121 9509	CERAMIC 0.1U Z 50V
D5201	407 100 6909	DIODE AG01-V2
D5202	407 100 6909	DIODE AG01-V2
D5203	407 053 4908	ZENER DIODE MTZ3.6A-T-77
IC521	409 170 5301	IC SI-3050C
IC522	409 170 5301	IC SI-3050C
IC523	409 170 5400	IC SI-3090C
R5201	401 016 7906	CARBON 2.4K JA 1/4W

IF PACK

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 079 2143	
C6101	403 028 4409	CERAMIC 56P J 50V
C6102	403 028 4409	CERAMIC 56P J 50V
C6103	403 028 4409	CERAMIC 56P J 50V
C6104	403 069 9500	CERAMIC 0.01U Z 50V
C6105	403 069 9500	CERAMIC 0.01U Z 50V
C6106	403 069 9500	CERAMIC 0.01U Z 50V
C6107	403 048 6902	ELECT 0.47U M 50V
C6108	403 115 6705	CERAMIC 30P J 50V
C6109	403 069 9500	CERAMIC 0.01U Z 50V
C6110	403 050 0509	ELECT 2.2U M 50V
C6111	403 069 9500	CERAMIC 0.01U Z 50V
C6112	403 042 3006	ELECT 100U M 16V
C6113	403 014 3409	CERAMIC 18P J 50V
C6114	403 033 4708	CERAMIC 82P J 50V
C6115	403 109 9200	CERAMIC 27P J 50V
C6116	403 049 0800	ELECT 1U M 50V
C6117	403 069 9500	CERAMIC 0.01U Z 50V
C6118	403 042 3006	ELECT 100U M 16V
C6119	403 048 6902	ELECT 0.47U M 50V
C6120	403 012 6808	CERAMIC 15PJ 50V
C6125	403 069 9500	CERAMIC 0.01U Z 50V
C6126	403 069 9500	CERAMIC 0.01U Z 50V
C6127	403 069 9500	CERAMIC 0.01U Z 50V
C6128	403 010 8606	CERAMIC 12P J 50V
C6129	403 068 0409	CERAMIC 0.1U Z 25V
C6133	403 069 9500	CERAMIC 0.01U Z 50V
C6134	403 068 0409	CERAMIC 0.1U Z 25V
C6135	403 068 0409	CERAMIC 0.1U Z 25V
C6136	403 047 0604	ELECT 4.7U M 25V
C6138	403 069 9500	CERAMIC 0.01U Z 50V
C6139	403 060 2401	POLYESTER 0.027U K 50V
C6140	403 069 1702	CERAMIC 1000P K 50V
C6141	403 068 0409	CERAMIC 0.1U Z 25V
C6142	403 012 6808	CERAMIC 15P J 50V
D6101	407 050 7704	ZENER DIODE GZA9.1Y
D6102	407 103 5305	DIODE 1SS318-TT51
IC611	409 036 0105	IC M51366SP
J6171	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J6172	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J6173	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J6174	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J6175	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J6178	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
L6102	613 014 5505	HF CHOKE 10UH K
L6103	613 014 5345	HF CHOKE 0.47UH M
L6104	613 014 0807	HF CHOKE 3.9UH K
L6105	613 014 5390	HF CHOKE 1.2UH M
L6106	613 014 5307	HF CHOKE 0.22UH M
L6107	613 015 7379	HF CHOKE 56UH K
Q6101	405 014 0303	TR 2SC2351-R2-T1
Q6102	405 004 3901	TR 2SA608-E-NP
OR	405 004 4502	TR 2SA608-F-NP
Q6103	405 015 8308	TR 2SC2812-L4-TB
OR	405 015 8902	TR 2SC2812-L7-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q6104	405 015 8308	TR 2SC2812-L4-TB
OR	405 015 8902	TR 2SC2812-L7-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q6105	405 015 8308	TR 2SC2812-L4-TB
Q6105	405 015 8902	TR 2SC2812-L7-TB
OR	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
R6101	401 037 5400	MT-GLAZE 1K JA 1/10W
R6102	401 037 5400	MT-GLAZE 1K JA 1/10W
R6103	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R6104	401 038 0503	MT-GLAZE 22 JA 1/10W
R6105	401 038 0602	MT-GLAZE 220 JA 1/10W
R6106	401 037 5202	MT-GLAZE 100 JA 1/10W
R6107	401 039 0601	MT-GLAZE 820K JA 1/10W
R6108	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R6109	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R6110	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R6111	401 037 5400	MT-GLAZE 1K JA 1/10W
R6112	401 038 2101	MT-GLAZE 2.7K JA 1/10W
R6113	401 038 9209	MT-GLAZE 6.8K JA 1/10W
R6114	401 038 7809	MT-GLAZE 56K JA 1/10W
R6116	401 038 2002	MT-GLAZE 270 JA 1/10W
R6117	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R6118	401 039 0304	MT-GLAZE 820 JA 1/10W
R6119	401 038 6208	MT-GLAZE 47 JA 1/10W
R6120	401 038 6505	MT-GLAZE 47K JA 1/10W
R6121	401 037 5400	MT-GLAZE 1K JA 1/10W
R6122	401 038 3504	MT-GLAZE 330 JA 1/10W
R6123	401 037 5400	MT-GLAZE 1K JA 1/10W
R6124	401 035 6607	MT-GLAZE 120 JA 1/8W
R6125	401 036 8105	MT-GLAZE 470 JA 1/8W
R6126	401 037 5202	MT-GLAZE 100 JA 1/10W
R6127	402 023 4506	FUSIBLE RES 27 JB 1/2W
R6129	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R6130	401 039 0403	MT-GLAZE 8.2K JA 1/10W
R6131	401 038 7205	MT-GLAZE 5.1K JA 1/10W
R6132	401 038 3702	MT-GLAZE 33K JA 1/10W
R6133	401 038 6208	MT-GLAZE 47 JA 1/10W
R6134	401 038 6307	MT-GLAZE 470 JA 1/10W
R6136	401 038 3504	MT-GLAZE 330 JA 1/10W
R6137	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R6138	401 038 6307	MT-GLAZE 470 JA 1/10W
R6139	401 038 7601	MT-GLAZE 560 JA 1/10W
R6140	401 037 5608	MT-GLAZE 10K JA 1/10W
R6141	401 037 5608	MT-GLAZE 10K JA 1/10W
R6142	401 037 5400	MT-GLAZE 1K JA 1/10W
R6143	401 037 5202	MT-GLAZE 100 JA 1/10W
R6144	401 037 5400	MT-GLAZE 1K JA 1/10W
R6146	401 038 0701	MT-GLAZE 2.2K JA 1/10W
R6150	401 037 9309	MT-GLAZE 18K JA 1/10W
R6151	401 038 6604	MT-GLAZE 470K JA 1/10W
R6152	401 038 3603	MT-GLAZE 3.3K JA 1/10W
R6153	401 038 6604	MT-GLAZE 470K JA 1/10W
R6157	401 037 5400	MT-GLAZE 1K JA 1/10W
R6159	401 039 0403	MT-GLAZE 8.2K JA 1/10W
VR611	613 001 8977	SEMI VR 1KB
OR	613 001 9219	SEMI VR 1KB
T6102	613 095 3100	TRANS.IF
T6103	613 016 0638	IFT
T6104	613 016 0836	IFT
T6105	613 095 3094	TRANS.IF
X6101	422 000 8006	SAW F KAF-39.5MR-MK-1
X6102	613 084 1667	FILTER
X6103	613 084 1735	FILTER
X6105	613 095 3070	DISCR.CERAMIC
X6109	613 095 3063	FILTER.6.55MHZ
X6111	422 000 7801	SAW F SAF32.9MC70Z

LOCATION	PARTS NO.	DESCRIPTION
COMPL,TN-5		
COMPL.NO.	613 088 3742	
B6701	405 076 6305	TR DTC314T-STP
B6702	405 076 6305	TR DTC314T-STP
C6701	403 001 2309	CERAMIC 0.01U N 16V
C6702	403 001 2309	CERAMIC 0.01U N 16V
C6703	403 048 6902	ELECT 0.47U M 50V
C6704	403 048 6902	ELECT 0.47U M 50V
C6705	403 001 2309	CERAMIC 0.01U N 16V
C6706	403 001 2309	CERAMIC 0.01U N 16V
C6707	403 014 0200	CERAMIC 18P J 50V
C6708	403 028 1606	CERAMIC 56P J 50V
C6709	403 014 0200	CERAMIC 18P J 50V
C6710	403 048 6902	ELECT 0.47U M 50V
C6711	403 001 2309	CERAMIC 0.01U N 16V
C6712	403 001 2309	CERAMIC 0.01U N 16V
C6713	403 042 3006	ELECT 100U M 16V
C6714	403 001 2309	CERAMIC 0.01U N 16V
C6715	403 001 2309	CERAMIC 0.01U N 16V
C6716	403 121 9509	CERAMIC 0.1U Z 50V
C6717	403 121 9509	CERAMIC 0.1U Z 50V
C6718	403 009 3001	CERAMIC 100P J 50V
C6719	403 009 3001	CERAMIC 100P J 50V
C6720	403 001 2309	CERAMIC 0.01U N 16V
C6721	403 038 2006	ELECT 100U M 6.3V
C6722	403 012 5900	CERAMIC 15P J 50V
C6723	403 012 5900	CERAMIC 15P J 50V
C6724	403 012 5900	CERAMIC 15P J 50V
C6725	403 014 0200	CERAMIC 18P J 50V
C6726	403 028 1606	CERAMIC 56P J 50V
C6727	403 023 9607	CERAMIC 39P J 50V
C6728	403 001 2309	CERAMIC 0.01U N 16V
C6729	403 001 2309	CERAMIC 0.01U N 16V
C6730	403 121 9509	CERAMIC 0.1U Z 50V
C6731	403 121 9509	CERAMIC 0.1U Z 50V
C6732	403 001 2309	CERAMIC 0.01U N 16V
C6733	403 038 9005	ELECT 33U M 6.3V
C6734	403 041 9405	ELECT 10U M 16V
C6735	403 001 2309	CERAMIC 0.01U N 16V
C6736	403 038 2006	ELECT 100U M 6.3V
C6737	403 043 9601	ELECT 47U M 16V
C6738	403 001 2309	CERAMIC 0.01U N 16V
C6739	403 001 2309	CERAMIC 0.01U N 16V
C6740	403 043 9601	ELECT 47U M 16V
C6741	403 017 7404	CERAMIC 22P J 50V
C6742	403 017 7404	CERAMIC 22P J 50V
C6743	403 001 2309	CERAMIC 0.01U N 16V
C6744	403 038 9708	ELECT 330U M 6.3V
C6745	403 062 8302	POLYESTER 680P J 50V
C6746	403 039 2609	ELECT 47U M 6.3V
C6747	403 087 3801	STYRENE 1200P J 50V
C6748	403 038 6301	ELECT 220U M 6.3V
C6749	403 087 3801	STYRENE 1200P J 50V
C6750	403 038 2006	ELECT 100U M 6.3V
C6751	403 039 2609	ELECT 47U M 6.3V
C6752	403 062 8302	POLYESTER 680P J 50V
C6753	403 046 2104	ELECT 3.3U M 25V
C6754	403 046 2104	ELECT 3.3U M 25V
C6755	403 046 2104	ELECT 3.3U M 25V
C6756	403 046 2104	ELECT 3.3U M 25V
C6757	403 067 5603	MT-COMPO 0.1U J 50V
C6758	403 067 5603	MT-COMPO 0.1U J 50V
C6759	403 046 2104	ELECT 3.3U M 25V
C6760	403 046 2104	ELECT 3.3U M 25V
C6761	403 001 2309	CERAMIC 0.01U N 16V
C6762	403 043 9601	ELECT 47U M 16V
C6763	403 041 9405	ELECT 10U M 16V
C6764	403 001 2309	CERAMIC 0.01U N 16V
C6765	403 038 2006	ELECT 100U M 6.3V
C6766	403 038 2006	ELECT 100U M 6.3V
C6767	403 001 2309	CERAMIC 0.01U N 16V
C6768	403 048 6902	ELECT 0.47U M 50V
C6769	403 041 9405	ELECT 10U M 16V
CT671	613 002 6255	TRIMMER
D6701	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D6702	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
IC671	409 161 5204	IC TA8662N
IC672	409 089 6109	IC LC3664NL-12
OR	410 063 3502	IC CXK5864BP-12L
OR	410 064 8803	IC CXK5864BP-12LL
IC673	409 161 5303	IC TC6011N
IC674	409 141 9109	IC TA78L010AP
IC675	409 163 2102	IC TD6710AN
IC676	409 018 5203	IC LA6462D
IC677	409 051 3006	IC TC4053BP
IC678	409 040 1105	IC NJM79L05A
L6701	613 015 2596	HF CHOKE 820UH J
L6702	613 015 2596	HF CHOKE 820UH J
L6703	613 014 0777	HF CHOKE 2.2UH M
L6704	613 014 0777	HF CHOKE 2.2UH M
Q6701	405 019 1909	TR 2SC536-E-NP-AA
OR	405 019 2708	TR 2SC536-F-NP-AA
Q6702	405 004 4007	TR 2SA608-E-SPA-AC
OR	405 004 4601	TR 2SA608-F-SPA-AC
R6701	401 012 4404	CARBON 100 JA 1/4W
R6702	401 017 0708	CARBON 270 JA 1/4W
R6703	401 012 6903	CARBON 10K JA 1/4W
R6704	401 016 3700	CARBON 2.2K JA 1/4W
R6705	401 023 0600	CARBON 82 JA 1/4W
R6706	401 016 5704	CARBON 220K JA 1/4W
R6707	401 014 6000	CARBON 150K JA 1/4W
R6708	401 022 1806	CARBON 680 JA 1/4W
R6709	401 020 7800	CARBON 510 JA 1/4W
R6710	401 012 5609	CARBON 1K JA 1/4W
R6711	401 019 2908	CARBON 39K JA 1/4W
R6712	401 012 5609	CARBON 1K JA 1/4W
R6713	401 020 0702	CARBON 470 JA 1/4W
R6714	401 019 2908	CARBON 39K JA 1/4W
R6715	401 012 5609	CARBON 1K JA 1/4W
R6716	401 020 2805	CARBON 47K JA 1/4W
R6717	401 020 2805	CARBON 47K JA 1/4W
R6718	401 020 2805	CARBON 47K JA 1/4W
R6719	401 020 2805	CARBON 47K JA 1/4W
R6720	401 020 2805	CARBON 47K JA 1/4W
R6721	401 020 2805	CARBON 47K JA 1/4W
R6722	401 022 4005	CARBON 68K JA 1/4W
R6723	401 018 4804	CARBON 33K JA 1/4W
R6724	401 018 4804	CARBON 33K JA 1/4W
R6725	401 019 1802	CARBON 3.9K JA 1/4W
R6726	401 019 0904	CARBON 390 JA 1/4W
R6727	401 016 3700	CARBON 2.2K JA 1/4W
R6728	401 012 6903	CARBON 10K JA 1/4W
R6729	401 019 1802	CARBON 3.9K JA 1/4W
R6730	401 019 0904	CARBON 390 JA 1/4W
R6731	401 016 3700	CARBON 2.2K JA 1/4W
R6732	401 012 6903	CARBON 10K JA 1/4W
R6733	401 017 2702	CARBON 27K JA 1/4W
R6734	401 018 3708	CARBON 3.3K JA 1/4W

LOCATION	PARTS NO.	DESCRIPTION
R6735	401 017 2702	CARBON 27K JA 1/4W
R6736	401 018 3708	CARBON 3.3K JA 1/4W
R6737	401 012 5609	CARBON 1K JA 1/4W
R6738	401 017 2702	CARBON 27K JA 1/4W
R6739	401 012 5609	CARBON 1K JA 1/4W
R6740	401 017 2702	CARBON 27K JA 1/4W
R6741	401 017 2702	CARBON 27K JA 1/4W
R6742	401 017 2702	CARBON 27K JA 1/4W
R6743	401 017 2702	CARBON 27K JA 1/4W
R6744	401 021 2903	CARBON 5.6K JA 1/4W
R6745	401 012 5609	CARBON 1K JA 1/4W
R6746	401 012 5609	CARBON 1K JA 1/4W
R6747	401 012 6903	CARBON 10K JA 1/4W
R6748	401 017 2702	CARBON 27K JA 1/4W
X6701	613 084 3227	OSC CRYSTAL,6.552MHZ
X6702	613 084 3234	OSC CRYSTAL,5.824MHZ
X6703	613 084 3258	RESONATOR,CERAMIC 16.93M
XF671	613 084 3173	FILTER,6.552MHZ
XF672	613 088 3537	FILTER,14KHZ L.P.F
XF673	613 088 3537	FILTER,14KHZ L.P.F
COMPL,TM-1		
COMPL.NO.	613 088 2257	
	613 022 0875	HOLDER,VFD
	613 079 0798	HOLDER
	613 089 2775	HOLDER,LED
	613 090 2498	HOLDER,LED
A7101	613 084 3197	VFD
A7102	613 088 5517	LEVEL METER
B7150	405 003 7603	TR 2SA1345-AC
B7151	405 018 2501	TR 2SC3399-AC
B7152	405 018 2501	TR 2SC3399-AC
B7153	405 003 7603	TR 2SA1345-AC
B7154	405 003 7603	TR 2SA1345-AC
C7101	403 009 1809	CERAMIC 10P J 50V
C7102	403 017 9705	CERAMIC 22P J 50V
C7103	403 017 9705	CERAMIC 22P J 50V
C7104	403 121 9509	CERAMIC 0.1U Z 50V
C7105	403 042 8407	ELECT 22U M 16V
C7106	403 001 1906	CERAMIC 0.01U M 16V
C7107	403 001 1906	CERAMIC 0.01U M 16V
C7108	403 048 7107	ELECT 0.47U M 50V
C7109	403 121 9509	CERAMIC 0.1U Z 50V
C7110	403 069 0309	CERAMIC 1000P J 50V
C7111	403 121 9509	CERAMIC 0.1U Z 50V
C7154	403 049 1005	ELECT 1U M 50V
C7155	403 049 1005	ELECT 1U M 50V
C7156	403 038 2105	ELECT 100U M 6.3V
CT711	613 002 6576	TRIMMER 20P N450
OR	613 002 6583	TRIMMER 20P N750
D7101	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7102	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7103	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7104	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7105	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7106	407 007 9904	DIODE GMA01-BT

LOCATION	PARTS NO.	DESCRIPTION
D7107	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7108	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7109	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7110	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7118	407 007 9904	DIODE GMA01-BT
D7121	407 007 9904	DIODE GMA01-BT
D7122	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7123	407 007 9904	DIODE GMA01-BT
D7125	407 007 9904	DIODE GMA01-BT
D7127	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7131	407 112 8007	LED BR5534S
D7151	407 007 9904	DIODE GMA01-BT
D7152	407 007 9904	DIODE GMA01-BT
D7153	407 007 9904	DIODE GMA01-BT
D7154	407 007 9904	DIODE GMA01-BT
D7155	407 007 9904	DIODE GMA01-BT
D7156	407 007 9904	DIODE GMA01-BT
D7160	407 110 4407	LED EAA5724S
D7161	407 110 4407	LED EAA5724S
D7162	407 075 3903	LED EBR5504S
D7163	407 075 3903	LED EBR5504S
D7164	407 075 3903	LED EBR5504S
D7165	407 075 3903	LED EBR5504S
IC711	409 173 1805	IC M50959-133SP
IC712	409 032 3308	IC MN1280-L
R7101	401 012 9201	CARBON 1M JA 1/4W
R7102	401 012 9904	CARBON 10M JA 1/4W
R7103	401 018 5702	CARBON 330K JA 1/4W
R7104	401 012 5609	CARBON 1K JA 1/4W
R7106	401 012 5609	CARBON 1K JA 1/4W
R7108	401 012 5609	CARBON 1K JA 1/4W
R7110	401 012 5609	CARBON 1K JA 1/4W
R7113	401 012 5609	CARBON 1K JA 1/4W
R7116	401 016 4707	CARBON 22K JA 1/4W
R7117	401 012 6903	CARBON 10K JA 1/4W
R7118	401 012 5609	CARBON 1K JA 1/4W
R7119	401 012 5609	CARBON 1K JA 1/4W
R7120	401 012 5609	CARBON 1K JA 1/4W
R7122	401 012 5609	CARBON 1K JA 1/4W
R7123	401 012 5609	CARBON 1K JA 1/4W
R7124	401 018 4804	CARBON 33K JA 1/4W
R7125	401 012 5609	CARBON 1K JA 1/4W
R7155	401 012 6903	CARBON 10K JA 1/4W
R7156	401 012 6903	CARBON 10K JA 1/4W
R7157	401 022 0700	CARBON 68 JA 1/4W
R7158	401 016 3700	CARBON 2.2K JA 1/4W
R7159	401 016 2505	CARBON 220 JA 1/4W
R7160	401 016 2505	CARBON 220 JA 1/4W
R7180	401 018 2701	CARBON 330 JA 1/4W
RB711	613 017 2877	RESISTOR PACK 10K X6 J
OR	613 079 5892	R-NETWORK,10KX6
RB712	613 017 2853	RESISTOR PACK 10K X4 J
OR	613 079 5878	R-NETWORK,10KX4
RR711	613 000 2204	REMOCON RECEIVER
S7101	613 006 3991	PUSH SWITCH
S7102	613 006 3991	PUSH SWITCH
S7103	613 006 3649	PUSH SWITCH
S7106	613 006 3649	PUSH SWITCH

LOCATION	PARTS NO.	DESCRIPTION
S7108	613 006 3649	PUSH SWITCH
S7113	613 006 3991	PUSH SWITCH
S7118	613 006 3649	PUSH SWITCH
S7120	613 006 3649	PUSH SWITCH
S7125	613 006 3991	PUSH SWITCH
S7126	613 006 3991	PUSH SWITCH
S7129	613 006 3649	PUSH SWITCH
S7130	613 006 3649	PUSH SWITCH
S7131	613 006 3649	PUSH SWITCH
S7137	613 006 3649	PUSH SWITCH
VR714	613 001 5587	SEMI VR 10KB
VR715	613 001 5587	SEMI VR 10KB
X7101	613 022 4569	CRYSTAL 6.291456MHZ
X7102	613 002 8457	CRYSTAL 32.768KHZ
OR	613 002 8594	CRYSTAL 32.768KHZ

COMPL,TM-2

COMPL.NO. 613 087 5051

LOCATION	PARTS NO.	DESCRIPTION
D7250	407 007 9904	DIODE GMA01-BT
OR	407 012 4406	DIODE 1SS133-T-77
D7252	407 051 5808	ZENER DIODE GZS3.9X-BT
JK720	613 079 2419	SOCKET,HEAD PHONE
R7250	401 014 5102	CARBON 15K JA 1/4W
R7251	401 014 8509	CARBON 1.6K JA 1/4W
R7252	401 015 2605	CARBON 1.8K JA 1/4W
R7253	401 014 8509	CARBON 1.6K JA 1/4W
R7254	401 015 2605	CARBON 1.8K JA 1/4W
S7242	613 081 0922	SLIDE SWITCH 1-2
S7250	613 081 0939	SLIDE SWITCH 2-3
S7251	613 006 3649	PUSH SWITCH
OR	613 079 4130	SW,PUSH
S7252	613 077 4354	PUSH SWITCH
OR	613 079 4154	SW,PUSH
S7253	613 077 4354	PUSH SWITCH
OR	613 079 4154	SW,PUSH
VR721	613 089 2331	VR,SLIDE 10KC
VR722	613 080 9360	VR,ROTARY 20KB
VR723	613 001 1015	VR 2KB

COMPL,TM-3

COMPL.NO. 613 091 4248

LOCATION	PARTS NO.	DESCRIPTION
B7301	405 003 7108	TR 2SA1341-TB
B7302	405 018 1900	TR 2SC3395-TB
C7301	403 042 7707	ELECT 22U M 16V
C7302	403 048 4205	ELECT 0.33U M 50V
C7303	403 041 8804	ELECT 10U M 16V
C7304	403 048 4205	ELECT 0.33U M 50V
C7305	403 071 8201	CERAMIC 2200P K 50V
C7306	403 069 1801	CERAMIC 1000P K 50V
C7307	403 042 7707	ELECT 22U M 16V
C7308	403 068 0409	CERAMIC 0.1U Z 25V
C7311	403 155 2804	DL-ELECT 0.047F Z 5.5V
C7334	403 041 8804	ELECT 10U M 16V
C7335	403 068 0409	CERAMIC 0.1U Z 25V
D7301	407 004 0706	DIODE DCB015-TB
OR	407 003 3609	DIODE DAN202K-T-96
IC731	409 114 4308	IC LA7214
J7311	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7312	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7313	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7314	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7315	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7316	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7317	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7318	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7319	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7320	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7321	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7322	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7323	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7324	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7325	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7326	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7327	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7335	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7336	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7337	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7338	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7339	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7340	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7341	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7342	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7343	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7344	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7345	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
PR731	613 000 2297	CIRCUIT PROTECTOR 0.8A 50V
Q7302	405 015 8407	TR 2SC2812-L5-TB
OR	405 015 8704	TR 2SC2812-L6-TB
Q7303	405 045 6701	TR 2SK436-18-TB
Q7312	405 002 6508	TR 2SA1179-M5-TB
R7301	401 038 6505	MT-GLAZE 47K JA 1/10W
R7302	401 013 5202	CARBON 1.2K JA 1/4W
R7303	401 037 5400	MT-GLAZE 1K JA 1/10W
R7304	401 037 5608	MT-GLAZE 10K JA 1/10W
R7305	401 035 5709	MT-GLAZE 1M JA 1/8W
R7308	401 037 5608	MT-GLAZE 10K JA 1/10W
R7309	401 038 6604	MT-GLAZE 470K JA 1/10W
R7310	401 038 3801	MT-GLAZE 330K JA 1/10W
R7311	401 038 3504	MT-GLAZE 330 JA 1/10W
R7312	401 038 3801	MT-GLAZE 330K JA 1/10W
R7313	401 036 3308	MT-GLAZE 270K JA 1/8W
R7314	401 035 5402	MT-GLAZE 100K JA 1/8W
R7347	401 035 5204	MT-GLAZE 10K JA 1/8W
R7348	401 035 5204	MT-GLAZE 10K JA 1/8W
R7349	401 035 5204	MT-GLAZE 10K JA 1/8W
R7350	401 037 5400	MT-GLAZE 1K JA 1/10W
R7351	401 037 5400	MT-GLAZE 1K JA 1/10W
R7352	401 035 4900	MT-GLAZE 1K JA 1/8W
R7364	401 037 5806	MT-GLAZE 1M JA 1/10W
R7365	401 037 5707	MT-GLAZE 100K JA 1/10W
R7367	401 038 3405	MT-GLAZE 33 JA 1/10W
R7373	401 037 9200	MT-GLAZE 1.8K JA 1/10W
R7380	401 012 6903	CARBON 10K JA 1/4W
R7381	401 012 6903	CARBON 10K JA 1/4W

COMPL,TM-4

COMPL.NO. 613 086 3577

LOCATION	PARTS NO.	DESCRIPTION
C7401	403 012 6907	CERAMIC 15P J 50V
C7402	403 010 1102	CERAMIC 1000P J 50V
C7403	403 010 1102	CERAMIC 1000P J 50V
C7404	403 046 3002	ELECT 3.3U M 25V

LOCATION	PARTS NO.	DESCRIPTION
CT741	613 002 6545	TRIMMER
D7401	407 004 0706	DIODE DCB015-TB
OR	407 003 3609	DIODE DAN202K-T-96
IC741	409 155 9003	IC M50552-101SP
OR	409 166 7906	IC M50552-001SP
J7401	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
J7402	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7403	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7404	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7405	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
J7406	401 037 5004	MT-GLAZE 0.000 ZA 1/10W
R7402	401 038 5102	MT-GLAZE 3.9K JA 1/10W
R7404	401 037 5400	MT-GLAZE 1K JA 1/10W
R7405	401 038 9704	MT-GLAZE 7.5K JA 1/10W
R7406	401 038 7700	MT-GLAZE 5.6K JA 1/10W
R7408	401 038 9605	MT-GLAZE 750 JA 1/10W
R7409	401 038 7205	MT-GLAZE 5.1K JA 1/10W
R7410	401 037 5400	MT-GLAZE 1K JA 1/10W
X7401	613 079 9104	OSC,CRYSTAL 17.73MHZ
OR	613 002 8709	CRYSTAL

COMPL,TM-5

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 087 5013	
	613 088 2691	BOARD,TERMINAL
	613 079 5083	HOLDER
C7421	403 071 6207	CERAMIC 220P K 50V
C7422	403 071 6207	CERAMIC 220P K 50V
C7423	403 071 6207	CERAMIC 220P K 50V
C7424	403 071 6207	CERAMIC 220P K 50V
D7441	407 106 3100	LED BG3668S
D7442	407 106 3100	LED BG3668S
D7443	407 106 3100	LED BG3668S
R7421	401 019 0904	CARBON 390 JA 1/4W
R7422	401 016 4707	CARBON 22K JA 1/4W
R7423	401 017 1705	CARBON 2.7K JA 1/4W
R7424	401 017 1705	CARBON 2.7K JA 1/4W
S7421	613 079 7025	SW,PUSH
S7422	613 079 7025	SW,PUSH
S7423	613 080 1272	SW,SLIDE 1P-2T
S7424	613 090 9848	SW,SLIDE 2P-2T
S7425	613 080 1272	SW,SLIDE 1P-2T

COMPL,TM-6

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 087 5020	
JK744	613 086 1207	JACK,MIC

COMPL,TM-7

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 087 5037	
JK743	613 080 1234	SOCKET,4P

COMPL,TB-1

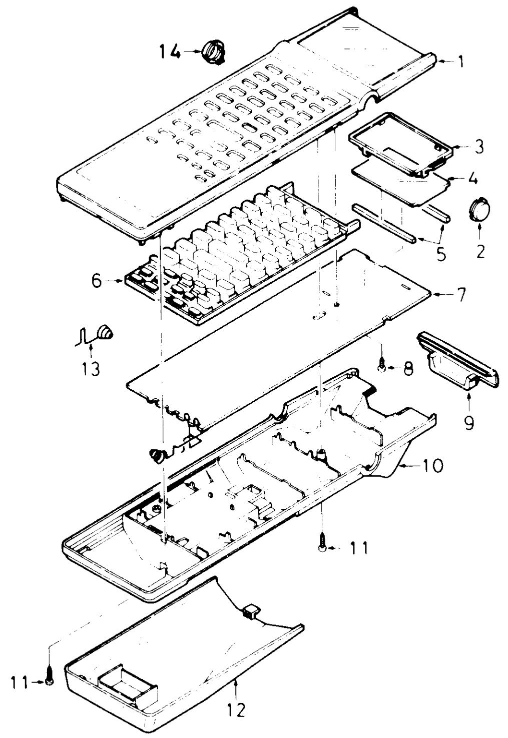
LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 090 8636	
C8501	403 071 6207	CERAMIC 220P K 50V
C8502	403 071 6207	CERAMIC 220P K 50V
C8504	403 071 6207	CERAMIC 220P K 50V
C8505	403 071 6207	CERAMIC 220P K 50V
C8507	403 071 6207	CERAMIC 220P K 50V
C8508	403 071 6207	CERAMIC 220P K 50V
C8509	403 071 6207	CERAMIC 220P K 50V
C8510	403 071 6207	CERAMIC 220P K 50V
C8513	403 071 6207	CERAMIC 220P K 50V
C8514	403 071 6207	CERAMIC 220P K 50V
C8515	403 071 6207	CERAMIC 220P K 50V
C8516	403 071 6207	CERAMIC 220P K 50V
C8521	403 121 9509	CERAMIC 0.1U Z 50V
D8551	407 012 4406	DIODE 1SS133-T-77
JK851	613 081 2407	JACK
JK852	613 081 2414	JACK
R8501	401 022 6702	CARBON 75 JA 1/4W
R8502	401 022 6702	CARBON 75 JA 1/4W
R8503	401 027 5205	CARBON 680 JA 1/6W
R8504	401 027 5205	CARBON 680 JA 1/6W
R8505	401 017 1705	CARBON 2.7K JA 1/4W
R8506	401 017 1705	CARBON 2.7K JA 1/4W
R8507	401 022 6702	CARBON 75 JA 1/4W
R8508	401 022 6702	CARBON 75 JA 1/4W
R8509	401 022 6702	CARBON 75 JA 1/4W
R8510	401 017 1705	CARBON 2.7K JA 1/4W
R8511	401 017 1705	CARBON 2.7K JA 1/4W
R8512	401 027 5205	CARBON 680 JA 1/6W
R8513	401 027 5205	CARBON 680 JA 1/6W
R8514	401 027 5205	CARBON 680 JA 1/6W
R8515	401 027 5205	CARBON 680 JA 1/6W
R8516	401 012 5609	CARBON 1K JA 1/4W
SW851	613 006 1973	SLIDE SWITCH
OR	613 006 2215	SLIDE SWITCH
VR851	613 001 0513	VR 100KB
VR852	613 001 0513	VR 100KB

COMPL,TB-2

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 087 5068	
JK871	613 080 1234	SOCKET,4P

REMOTE CONTROL

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 091 7607	
1	613 092 1147	ASSY,CABINET,TOP
2	613 086 5182	KNOB
3	613 087 9189	BRACKET,LCD
4	613 085 5299	LCD
5	613 087 8816	CONNECTOR
6	613 092 1369	BUTTON
7	613 087 5129	COMPL,RM-1
8	411 104 7008	SCR S-TPG BIN 2X5
9	613 086 5038	WINDOW
10	613 089 6100	ASSY,CABINET,BOTTOM
11	411 101 9203	SCR S-TPG PAN 2X12
12	613 086 5014	LID,BATTERY
13	613 087 8823	TERMINAL,BATTERY
14	613 086 7940	KNOB



COMPL,RM-1

LOCATION	PARTS NO.	DESCRIPTION
COMPL.NO.	613 087 5129	
	613 087 8830	TERMINAL,BATTERY,+
	613 087 8847	TERMINAL,BATTERY,-
C1	403 068 0508	CERAMIC 0.1U Z 25V
C2	403 068 0508	CERAMIC 0.1U Z 25V
C3	403 068 0508	CERAMIC 0.1U Z 25V
C4	403 018 7908	CERAMIC 220P J 50V
C5	403 018 7908	CERAMIC 220P J 50V
C6	403 050 0509	ELECT 2.2U M 50V
C8	403 108 4305	ELECT 100U M 4V
CF1	613 087 8892	RESONATOR,CERAMIC 800KHZ
IC1	409 160 6301	IC LC5864H-676
IC2	409 152 5404	IC TC7S08F
LED1	407 017 3701	LED SE303A
R1	401 011 8700	CARBON 1 JA 1/4W
R2	401 036 5104	MT-GLAZE 33K JA 1/8W
R3	401 035 5709	MT-GLAZE 1M JA 1/8W
R4	401 035 4108	MT-GLAZE 0.000 ZA 1/8W
R5	401 037 2607	MT-GLAZE 680K JA 1/8W
SW3	613 087 8885	SW,PUSH 1-1
TR1	405 085 9304	TR UN7231
VC1	613 087 2043	CAP,TRIM 20P
X1	613 082 8156	OSC,CRYSTAL 38.2293KHZ

SANYO

SANYO Electric Co., Ltd.
Osaka, Japan

Apr./'89/2000 NS Printed in Japan

BLOCK DIAGRAMS, CIRCUIT DIAGRAMS & PRINTED CIRCUIT BOARDS

VHR-D4890E (U.K.)

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————	SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM	Ⓔ
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COMPL. DM-1	ANALOG PROCESS FOR DIGITAL MEMORY CIRCUIT	Ⓝ
COMPL. DM-3	DIGITAL MEMORY CIRCUIT	
COMPL. DM-1,3	P.C.B.	Ⓞ
COMPL. DM-4	DIGITAL CONTROL MEMORY & P.C.B.	
COMPL. TM-1,2	TIMER, DISPLAY, TUNING CONTROL, H.P. JACK & SWITCH CIRCUIT	Ⓟ
COMPL. TM-3,4	SYNC. SEPARATION & BACK GROUND FOR CHANNEL SCAN. CIRCUIT	
COMPL. TM-1,2,3,4	P.C.B.	Ⓠ

DP4PHSL/E 94H

REFERENCE NO. WM-530298

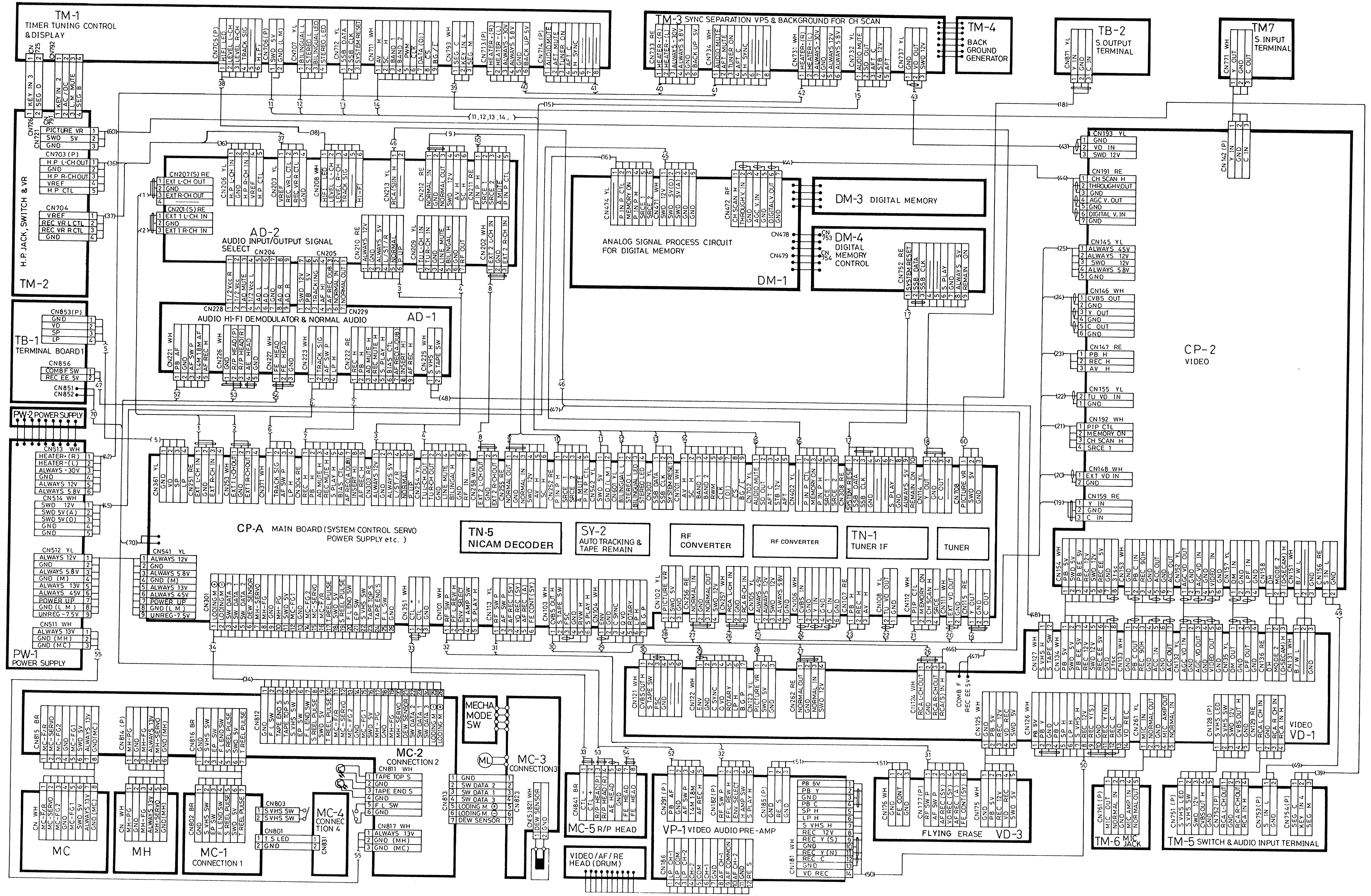
NOTES:

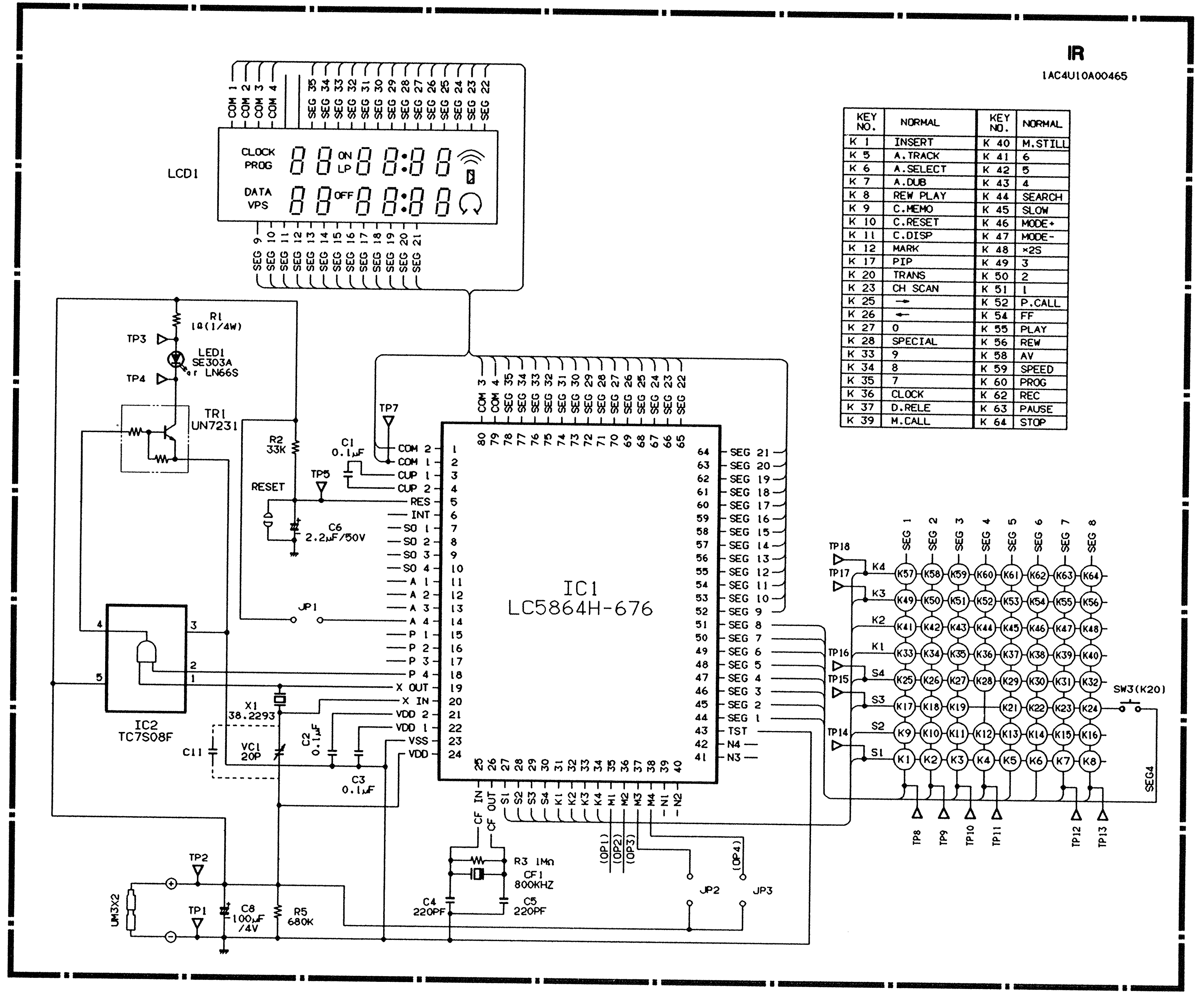
1. All resistance values in "OHMS" unless otherwise noted. (K=1,000 M=1,000,000)
2. All capacitance values in "μfd" unless otherwise noted. p=pico farad
3. All inductance values in "mH" unless otherwise noted. μ=micro henry

PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SYMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

OVERALL WIRING DIAGRAM


TM-1 TIMER TUNING CONTROL &DISPLAY
TM-3 SYNC SEPARATION VPS & BACKGROUND FOR CH SCAN
TM-4 BACK GROUND GENERATOR
TB-2 S.OUTPUT TERMINAL
TM7 S.INPUT TERMINAL
TM-2
H.P JACK, SWITCH & VR
TB-1 TERMINAL BOARD
PW-2 POWER SUPPLY
PW-1 POWER SUPPLY
AD-2 AUDIO INPUT/OUTPUT SIGNAL SELECT
AD-1 AUDIO HI-FI DEMODULATOR & NORMAL AUDIO
DM-1
ANALOG SIGNAL PROCESS CIRCUIT FOR DIGITAL MEMORY
DM-3 DIGITAL MEMORY
DM-4 DIGITAL MEMORY CONTROL
CP-2 VIDEO
CP-A MAIN BOARD (SYSTEM CONTROL SERVO POWER SUPPLY etc.)
TN-5 NICAM DECODER
SY-2 AUTO TRACKING & TAPE REMAIN
RF CONVERTER
RF CONVERTER
TN-1 TUNER IF
TUNER
VD-1 VIDEO
MC-2 CONNECTION 2
MC-3 CONNECTION3
MECHA MODE SW
MC
MH
MC-1 CONNECTION 1
MC-4 CONNECTION 4
MC-5 R/P HEAD
VIDEO/AF/RE HEAD (DRUM)
VP-1 VIDEO AUDIO PRE-AMP
FLYING ERASE
VD-3
TM-6 MIC JACK
TM-5 SWITCH & AUDIO INPUT TERMINAL


LCD1
CLOCK
PROG
DATA
VPS
IC1
LC5864H-676
IC2
TC7S08F
R1 18(1/4W)
LED1 SE303A LN66S
TR1 UN7231
R2 33K
C1 0.1μF
RESET
C6 2.2μF/50V
TP3
TP4
TP5
TP7
JP1
X1 38.2293
VC1 20P
C2 0.1μF
C3 0.1μF
C11
TP2
TP1
C8 100μF /4V
R5 680K
UM3X2
R3 1MΩ
CF1 800KHZ
C4 220PF
C5 220PF
JP2
JP3
SW3(K20)
SEG4
TP6
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TP15
TP16
TP17
TP18

IR

1AC4U10A00465

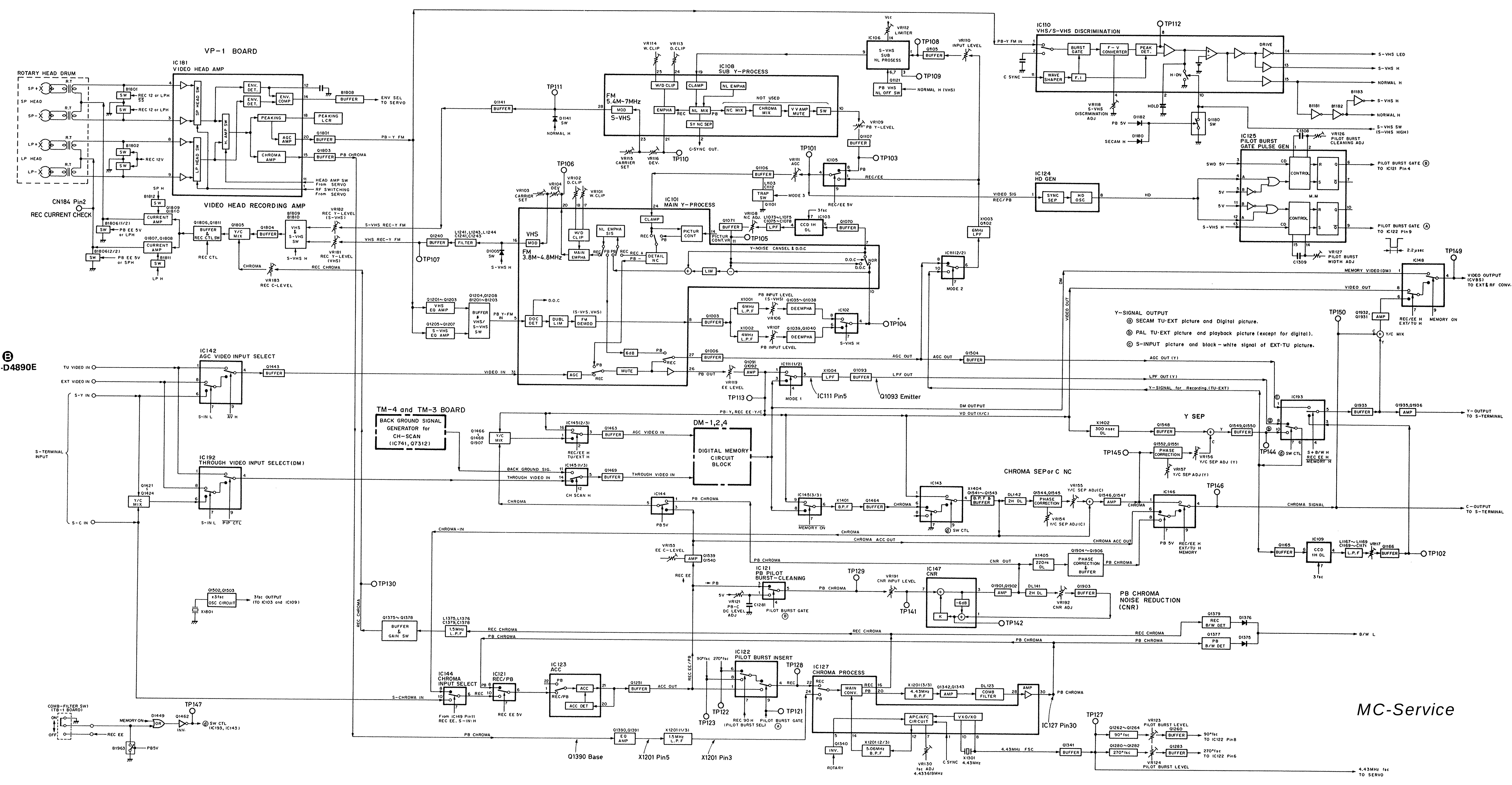
KEY NO.	NORMAL	KEY NO.	NORMAL
K 1	INSERT	K 40	M.STILL
K 5	A.TRACK	K 41	6
K 6	A.SELECT	K 42	5
K 7	A.DUB	K 43	4
K 8	REW PLAY	K 44	SEARCH
K 9	C.MEMO	K 45	SLOW
K 10	C.RESET	K 46	MODE+
K 11	C.DISP	K 47	MODE-
K 12	MARK	K 48	×2S
K 17	PIP	K 49	3
K 20	TRANS	K 50	2
K 23	CH SCAN	K 51	1
K 25	→	K 52	P.CALL
K 26	←	K 54	FF
K 27	0	K 55	PLAY
K 28	SPECIAL	K 56	REW
K 33	9	K 58	AV
K 34	8	K 59	SPEED
K 35	7	K 60	PROG
K 36	CLOCK	K 62	REC
K 37	D.RELE	K 63	PAUSE
K 39	M.CALL	K 64	STOP

Ⓐ VHR-D4890E

MC-Service

VIDEO CIRCUIT BASIC BLOCK DIAGRAM

Ⓑ VHR-D4890E


VP-1 BOARD
ROTARY HEAD DRUM
SP HEAD
LP HEAD
IC181 VIDEO HEAD AMP
SP HEAD SW
LP HEAD SW
H. AMP SW
ENV. DET.
ENV. COMP
PEAKING
AGC AMP
CHROMA AMP
PEAKING LCR
ENV SEL TO SERVO
HEAD AMP SW From SERVO
RF SWITCHING From SERVO
PB-Y FM
PB CHROMA
VIDEO HEAD RECORDING AMP
CN184 Pin2
REC CURRENT CHECK
CURRENT AMP
BUFFER & REC CTL SW
Y/C MIX
VHS & S-VHS SW
VR182 REC Y-LEVEL (S-VHS)
VR181 REC Y-LEVEL (VHS)
VR183 REC C-LEVEL
S-VHS REC-Y FM
VHS REC-Y FM
REC CHROMA
IC108 SUB Y-PROCESS
FM 5.4M~7MHz S-VHS
IC101 MAIN Y-PROCESS
VHS FM 3.8M~4.8MHz
IC110 VHS/S-VHS DISCRIMINATION
IC125 PILOT BURST GATE PULSE GEN
IC124 HD GEN
VR127 PILOT BURST WIDTH ADJ
IC148
MEMORY VIDEO (DM)
VIDEO OUT
VIDEO OUTPUT (CVBS) TO EXT & RF CONV.
MEMORY ON
IC142 AGC VIDEO INPUT SELECT
IC192 THROUGH VIDEO INPUT SELECT (DM)
TM-4 and TM-3 BOARD
BACK GROUND SIGNAL GENERATOR for CH-SCAN (IC741, Q7312)
DM-1,2,4
DIGITAL MEMORY CIRCUIT BLOCK
AGC VIDEO IN
THROUGH VIDEO IN
IC111 Pin5
Q1093 Emitter
DM OUTPUT
VD OUT (Y/C)
Y SEP
IC193
Y-OUTPUT TO S-TERMINAL
CHROMA SEP or C NC
IC143
IC146
CHROMA SIGNAL
C-OUTPUT TO S-TERMINAL
IC109 CCD 1H DL
IC121 PB PILOT BURST-CLEANING
IC147 CNR
PB CHROMA NOISE REDUCTION (CNR)
IC144 CHROMA INPUT SELECT
IC121 REC/PB
IC123 ACC
IC122 PILOT BURST INSERT
IC127 CHROMA PROCESS
APC/AFC CIRCUIT
VXO/XO
4.43MHz FSC
Q1390 Base
X1201 Pin5
X1201 Pin3
IC127 Pin30
TP101
TP102
TP103
TP104
TP105
TP106
TP107
TP108
TP109
TP110
TP111
TP112
TP113
TP121
TP122
TP123
TP127
TP128
TP129
TP130
TP141
TP142
TP144
TP145
TP146
TP147
TP149
TP150

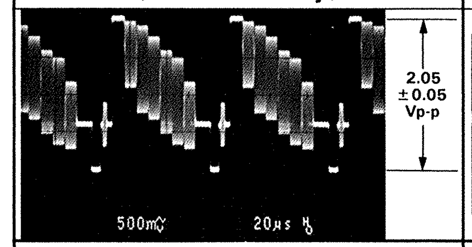
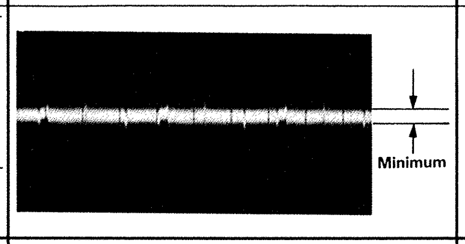
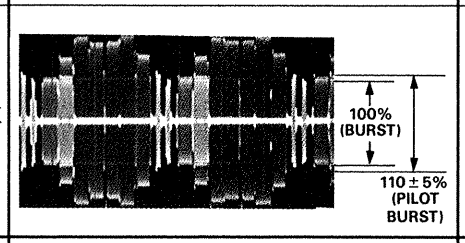
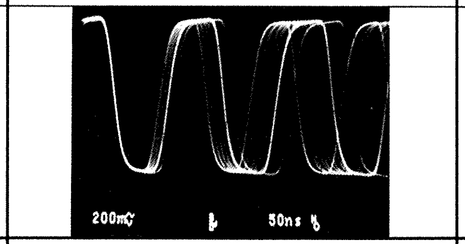
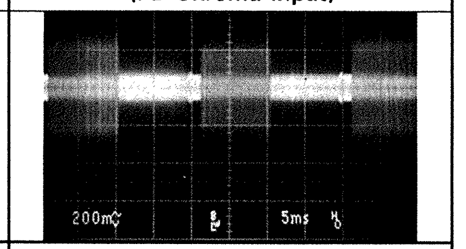
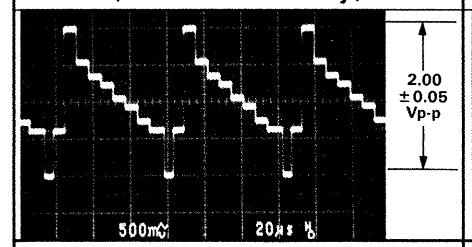
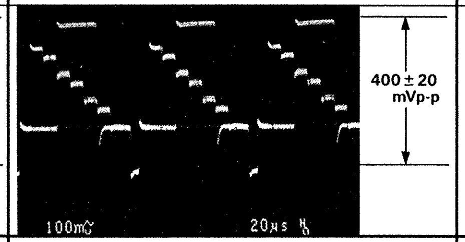
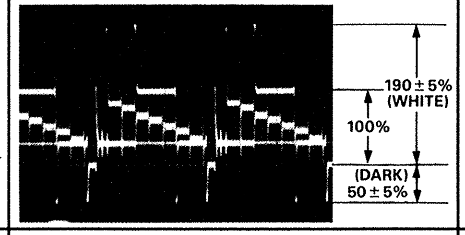
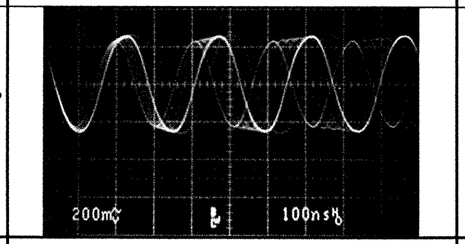
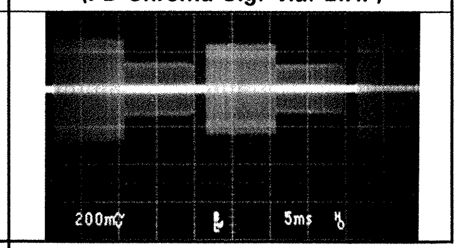
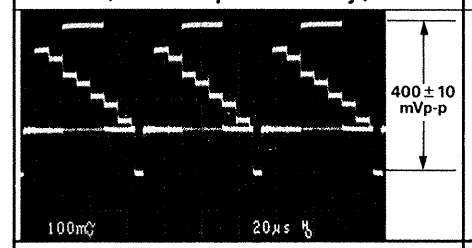
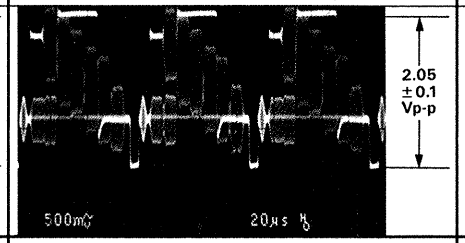
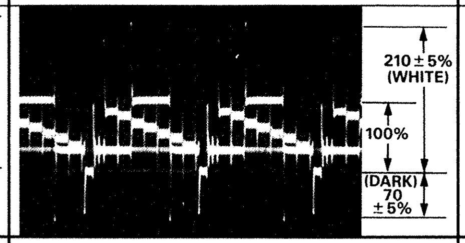
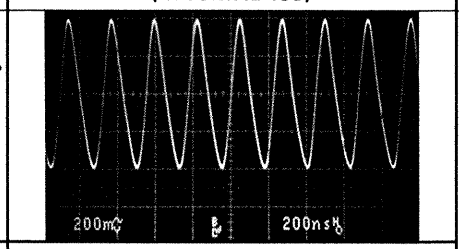
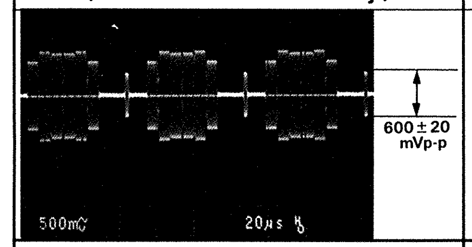
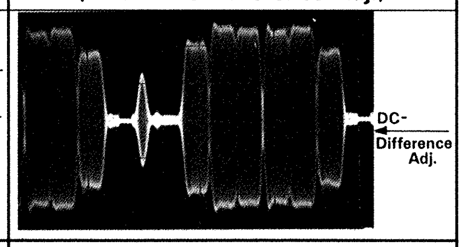
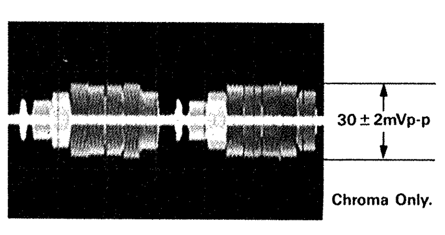
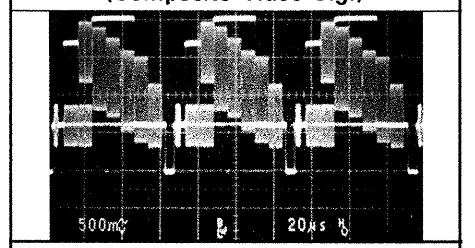
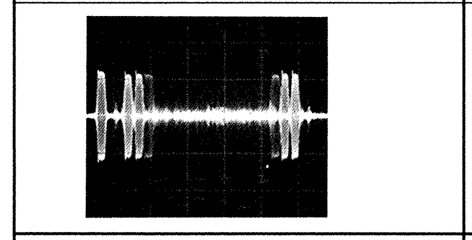
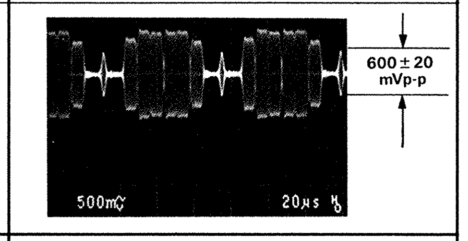
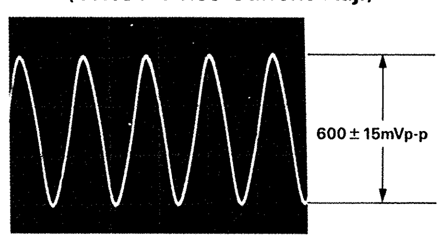
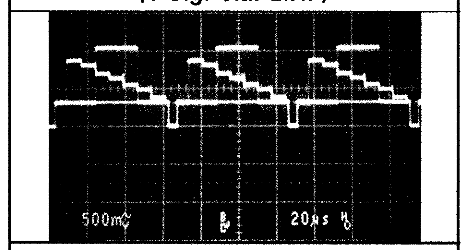
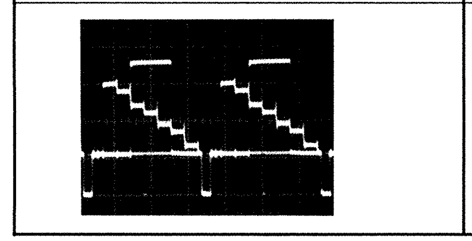
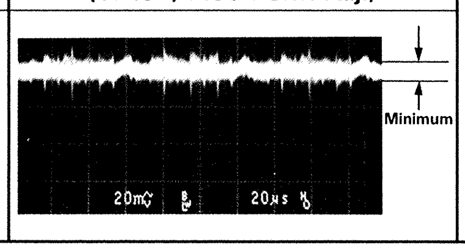
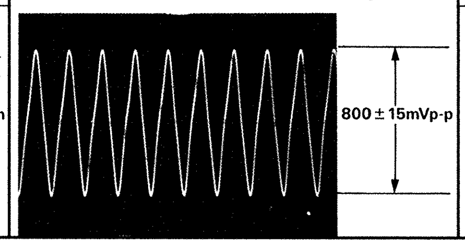
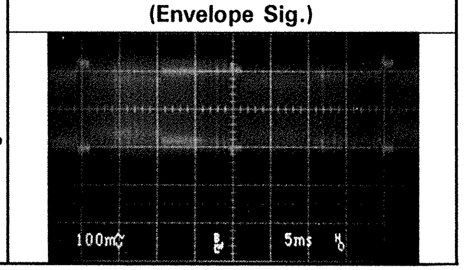
Y-SIGNAL OUTPUT

ⓐ SECAM TU·EXT picture and Digital picture.

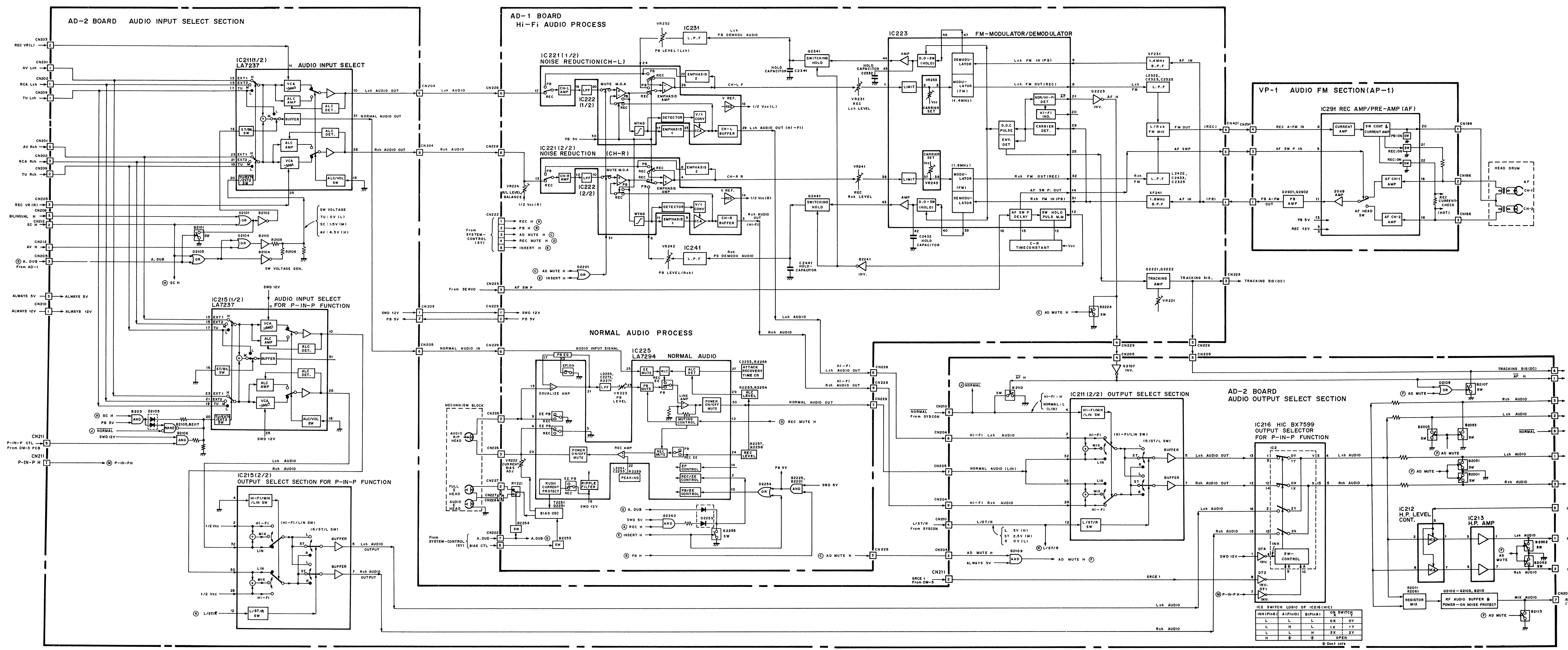
ⓑ PAL TU·EXT picture and playback picture (except for digital).

ⓒ S-INPUT picture and black-white signal of EXT·TU picture.

WAVEFORM OF VIDEO

TP149 E-E-mode **(VR111 AGC Adj.)** 	**TP104 + TP105 (INV.) PB mode** **(VR108 NC Adj.)** 	**TP130 S·VHS, E-E mode** **(VR123 Pilot Burst Level Adj.)** 	**TP111 S·VHS REC mode** **(5.4MHz ~7MHz FM)** 	**X1201 Pin 5 PB mode** **(PB Chroma Input)** 
TP113 PIP mode **(VR119 E-E Level Adj.)** 	**TP108 VHS/S·VHS PB mode** **(VR107&VR106 PB Input Level Adj.)** 	**TP106 VHS E-E mode** **(VR101, VR102 White/Dark Clip Adj.)** 	**TP107 VHS REC mode** **(3.8MHz ~4.8MHz FM)** 	**X1201 Pin 3 PB mode** **(PB Chroma Sig. via. B.P.F)** 
TP108 E-E mode **(VR110 Input level Adj.)** 	**TP149 PB mode** **(VR109 PB Level Adj.)** 	**TP110 S·VHS, E-E mode** **(VR114, VR113 White/Dark Clip Adj.)** 	**TP127 REC/PB mode** **(4.43MHz fsc)** 	
TP150 E-E mode **(VR153 Chroma Level Adj.)** 	**TP129 S·VHS, PB mode** **(VR121 DC Difference Adj.)** 	**CN184 Pin 2 (VP-1) LPREC mode** **(VR183 Chroma Rec. Current Adj.)** 	**IC111 Pin 5 E-E mode** **(Composite Video Sig.)** 	
TP145 E-E mode **(VR154, VR155 Chroma-SEP. Adj.)** 	**TP150 PB mode** **(VR191 CNR Input Level Adj.)** 	**VHS LP REC mode** **(VR181 Y-Rec Current Adj.)** 	**Q1093 Emitter E-E mode** **(Y-Sig. via. L.P.F)** 	
TP144 E-E mode **(VR156, VR157 Y-SEP. Adj.)** 	**TP142 PB mode** **(VR192, L1902 CNR Adj.)** 	**S·VHS LP REC mode** **(VR182 Y-Rec. Current Adj.)** 	**Q1390 Base PB mode** **(Envelope Sig.)** 	

AUDIO CIRCUIT BASIC BLOCK DIAGRAM


AD-2 BOARD AUDIO INPUT SELECT SECTION
CN203 REC VR(L)
CN201 AV Lch
CN202 RCA Lch
CN209 TU Lch
CN201 AV Rch
CN202 RCA Rch
CN209 TU Rch
CN203 REC VR(R)
CN209 BILINGUAL H
CN212 SC H
CN212 AV H
CN205 Ⓖ A. DUB From AD-1
ALWAYS 5V → ALWAYS 5V
CN210 ALWAYS 12V → ALWAYS 12V
IC211(1/2) LA7237 AUDIO INPUT SELECT
EXT1 EXT2 TU VCA ALC AMP ALC DET. BUFFER ST/BIL SW TU/EXT1/EXT2 SW ALC/VOL SW
Lch AUDIO OUT
NORMAL AUDIO OUT
Rch AUDIO OUT
D2101 OR B2102
B2101 SW
D2104 OR B2110 R2105
D2105 OR B2104 R2106
A. DUB
SW VOLTAGE GEN.
SW VOLTAGE TU : 0V (L) SC : 1.5V (M) AV : 4.5V (H)
Ⓗ SC H
SWD 12V
IC215(1/2) LA7237 AUDIO INPUT SELECT FOR P-IN-P FUNCTION
Ⓗ SC H
PB 5V
Ⓙ NORMAL
SWD 12V
B203 AND D2103 NAND B2105,B2117 B2106 ANG
CN211 P-IN-P CTL From DM-3 PCB
CN211 P-IN-P H → Ⓜ P-IN-PH
Lch AUDIO
Rch AUDIO
IC215(2/2) OUTPUT SELECT SECTION FOR P-IN-P FUNCTION
HI-FI/MIX/LIN SW
1/2 Vcc HI-FI MIX LIN
(HI-FI/LIN SW) (R/ST/L SW)
BUFFER Lch AUDIO OUTPUT
BUFFER Rch AUDIO OUTPUT
Ⓚ L/ST/R L/ST/R SW
CN204 Lch AUDIO
CN204 Rch AUDIO
CN205 SWD 12V PB 5V
CN205 NORMAL AUDIO IN
AD-1 BOARD Hi-Fi AUDIO PROCESS
VR232 IC231 L.P.F Lch PB DEMODU AUDIO PB LEVEL (Lch)
IC221(1/2) NOISE REDUCTION(CH-L)
CN228 Lch AUDIO
CH-L AMP IC222 (1/2) LPF MUTE M.O.A EMPHASIS AMP EMPHASIS 2 V REF. REG DETECTOR V/I CONV WTNG EMPHASIS 1 CCA CH-L BUFFER
CH-L F
1/2 Vcc (L)
Lch AUDIO OUT (HI-FI)
PB 5V
IC221(2/2) NOISE REDUCTION (CH-R)
CN228 Rch AUDIO
VR224 R/L LEVEL BALANCE 1/2 Vcc(R)
CH-R AMP IC222 (2/2) CH-R R 1/2 Vcc (R) CH-R BUFFER Rch AUDIO OUT (HI-FI)
VR242 IC241 L.P.F Rch P3 DEMODU AUDIO PB LEVEL(Rch)
CN222 From SYSTEM-CONTROL (SY)
REC H Ⓐ
PB H Ⓑ
AD MUTE H Ⓒ
REC MUTE H Ⓓ
INSERT H Ⓔ
Ⓒ AD MUTE H Ⓔ INSERT H D2201 OR
CN223 From SERVO AF SW P
Q2341 SWITCHING HOLD
HOLD CAPACITOR C2341
HOLD CAPACITOR C2332
VR231 REC Lch LEVEL
VR241 REC Rch LEVEL
Q2441 SWITCHING HOLD
C2441 HOLD-CAPACITOR
B2241 INV.
C2432 HOLD CAPACITOR
IC223 FM-MODULATOR/DEMODULATOR
AMP D.O-SW (HOLD) DEMODULATOR LIMIT VR233 CARRIER SET MODULATOR (FM) (1.4MHz) (1.8MHz) VR243
NOR/HI-FI DET HI-FI IND. D.O.C PULSE ENV. DET CARRIER DET. AF SW P DELAY SW HOLD PULS M.M C-R TIMECONSTANT Vcc
Lch FM IN (PB)
Lch FM OUT (REC)
Rch FM OUT (REC)
AF SW P. OUT
Rch FM IN (PB)
Q2223 INV. AF H
XF231 1.4MHz B.P.F AF IN
L2322, C2323, C2325 L.P.F Lch FM
L/Rch FM MIX FM OUT (REC)
AF SWP
L2422, C2433, C2325 L.P.F Rch FM
XF241 1.8MHz B.P.F AF IN (PB)
Q2221,Q2222 TRACKING AMP VR221 TRACKING SIG.
CN223 TRACKING SIG (DC)
Ⓒ AD MUTE H B2224 SW
CN421 CN291
VP-1 AUDIO FM SECTION(AP-1)
IC291 REC AMP/PRE-AMP (AF)
REC A-FM IN CURRENT AMP SW CONT & CURRENT AMP PB:ON REC:ON SW
AF SW P IN
PB A-FM OUT Q2901,Q2902 PB AMP 20dB AMP AF HEAD SW AF CH-1 AMP AF CH-2 AMP
PB 5V REC 12V
REC CURRENT CHECK (HOT)
CN186
HEAD DRUM AF CH-1 CH-2
NORMAL AUDIO PROCESS
CN229 SWD 12V PB 5V
CN229 NORMAL AUDIO IN
AUDIO INPUT SIGNAL
IC225 LA7294 NORMAL AUDIO
PB EQ EP:ON EQUALIZE AMP EE PB REC
L2255, C2273, R2271 LPF VR223 PB LEVEL
EE MUTE ALC ALC DET REC EE PB MUTE PB LINE AMP POWER ON/OFF MUTE MUTING CONTROL REC MUTE REC EE REC AMP
C2253,R2255 ATTACK RECOVERY TIME CR
R2253,R2254 ALC LEVEL
R2257, R2258 REC LEVEL
EP CONTROL REC/EE CONTROL PB/EE CONTROL
L2254, C2255, R2259 PEAKING
POWER ON/OFF MUTE
RUSH CURRENT PROTECT RIPPLE FILTER SWD 12V
T2251 Q2251 BIAS OSC
MECHANISM BLOCK
AUDIO R/P HEAD
FULL E HEAD
AUDIO E HEAD
CN226 CN227 RY221
VR222 CURRENT BIAS ADJ
B2254 SW
CN222 From SYSTEM-CONTROL (SY) A. DUB BIAS CTL
A. DUB Ⓖ
B2253 SW
Ⓓ REC MUTE H
NORMAL AUDIO OUT
PB 5V
D2254 OR B2225, B2201 AND SWD 5V
Ⓖ A. DUB
SWD 5V
Ⓐ REC H
Ⓔ INSERT H
B2260 AND D2253 B2255 SW
Ⓑ PB H
Ⓒ AD MUTE H
Lch AUDIO
Rch AUDIO
HI-FI Lch AUDIO OUT
HI-FI Rch AUDIO OUT
CN228 CN229
CN229 CN205 Q2107 INV.
AF H
Ⓙ NORMAL
B2112 SW
HI-FI : H NORMAL : L (LIN)
CN210 NORMAL From SYSCON
IC211(2/2) OUTPUT SELECT SECTION
HI-FI/MIX/LIN SW (HI-FI/LIN SW) (R/ST/L SW) BUFFER L/ST/R SW
CN204 HI-FI Lch AUDIO
CN205 NORMAL AUDIO (LIN)
CN204 HI-FI Rch AUDIO
CN210 L/ST/R From SYSCON
L 5V (H) ST 2.5V (M) R 0V (L)
Ⓚ L/ST/R
CN204 AD MUTE H
B2109 AND ALWAYS 5V AD MUTE H Ⓕ
CN211 SRCE 1 From DM-3
SRCE 1
Lch AUDIO OUT
Rch AUDIO OUT
AD-2 BOARD AUDIO OUTPUT SELECT SECTION
IC216 HIC BX7599 OUTPUT SELECTOR FOR P-IN-P FUNCTION
IC2 0Y 1Y 2Y 0X 1X 2X INH SW-CONTROL
SWD 12V DT4 INV. DT2 INV. DT1 INV.
Ⓜ P-IN-P H
Lch AUDIO Rch AUDIO
TRACKING SIG (DC)
D2108 OR B2107 SW
Ⓕ AD MUTE
B2003 SW B2053 SW
B2051 SW B2001 SW
IC212 H.P. LEVEL CONT. VCA
IC213 H.P. AMP
Ⓕ AD MUTE B2002 SW B2052 SW
R2011 R2061 REGISTOR MIX
Q2102—Q2105, B2115 RF AUDIO BUFFER & POWER—ON NOISE PROTECT
MIX AUDIO
Ⓕ AD MUTE B2113
TRACKING SIG.
HI-FI LED
(CN208)
LEVEL R
LEVEL L
NORMAL
AUDIO LEVEL METER & DISPLAY (TO TM-1 BOARD)
EXT Lch AUDIO
(CN207)
EXT Rch AUDIO
TO AV TERMINAL
H.P CONT.
(CN206)
H.P Lch
H.P Rch
H.P. JACK (TO TM-2 BOARD)
CN209 RF AUDIO OUT (TO RF CONV.)
K J I H G F E D C B A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

IC2 SWITCH LOGIC OF IC216(HIC)

INH(Pin6)	A(Pin10)	B(Pin9)	ON SWITCH X	ON SWITCH Y
L	L	L	0X	0Y
L	H	L	1X	1Y
L	L	H	2X	2Y
H	※	※	OPEN	

※ Dont care

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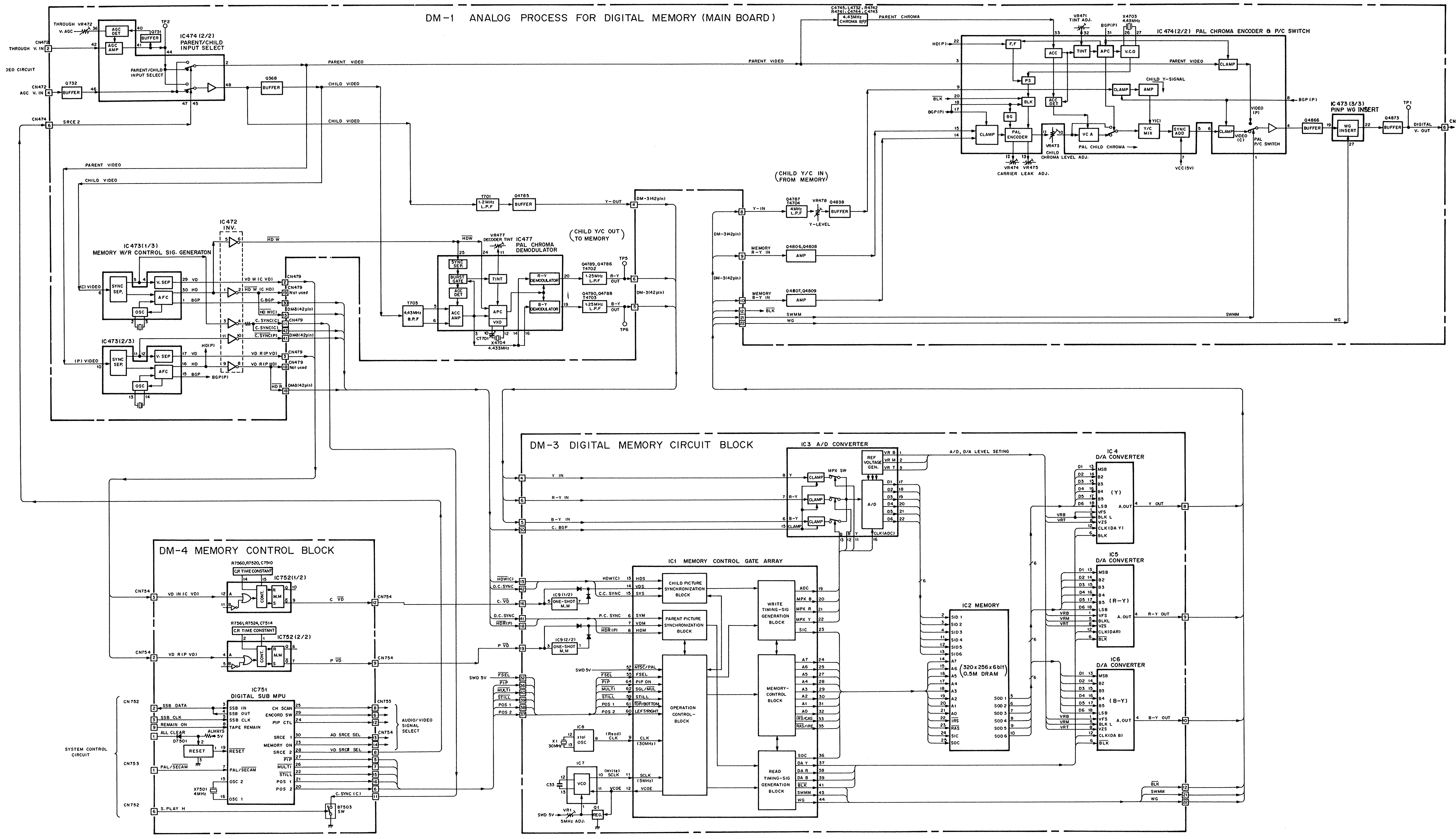
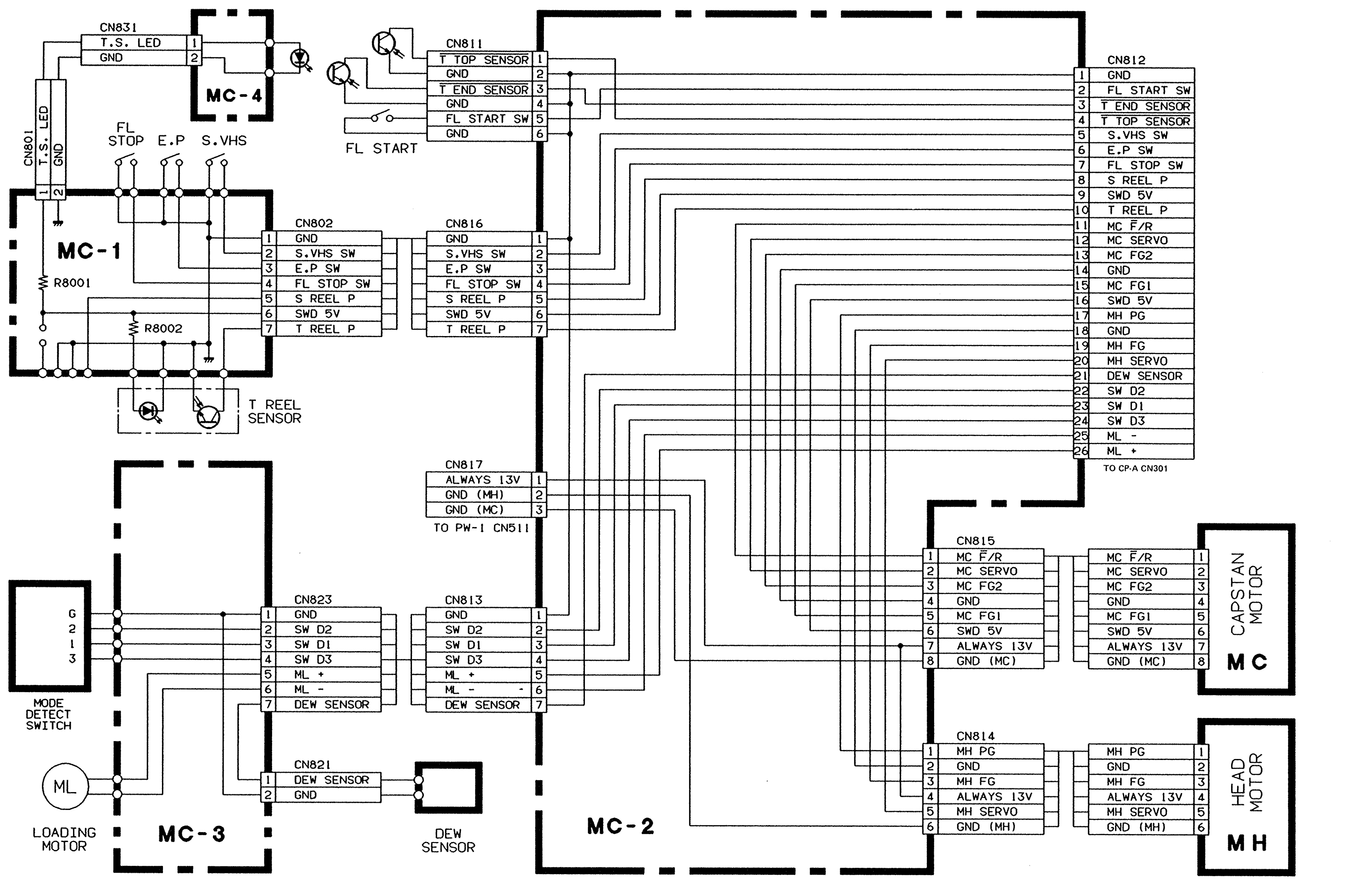
Ⓓ VHR-D4890E

DIGITAL MEMORY CIRCUIT BASIC BLOCK DIAGRAM



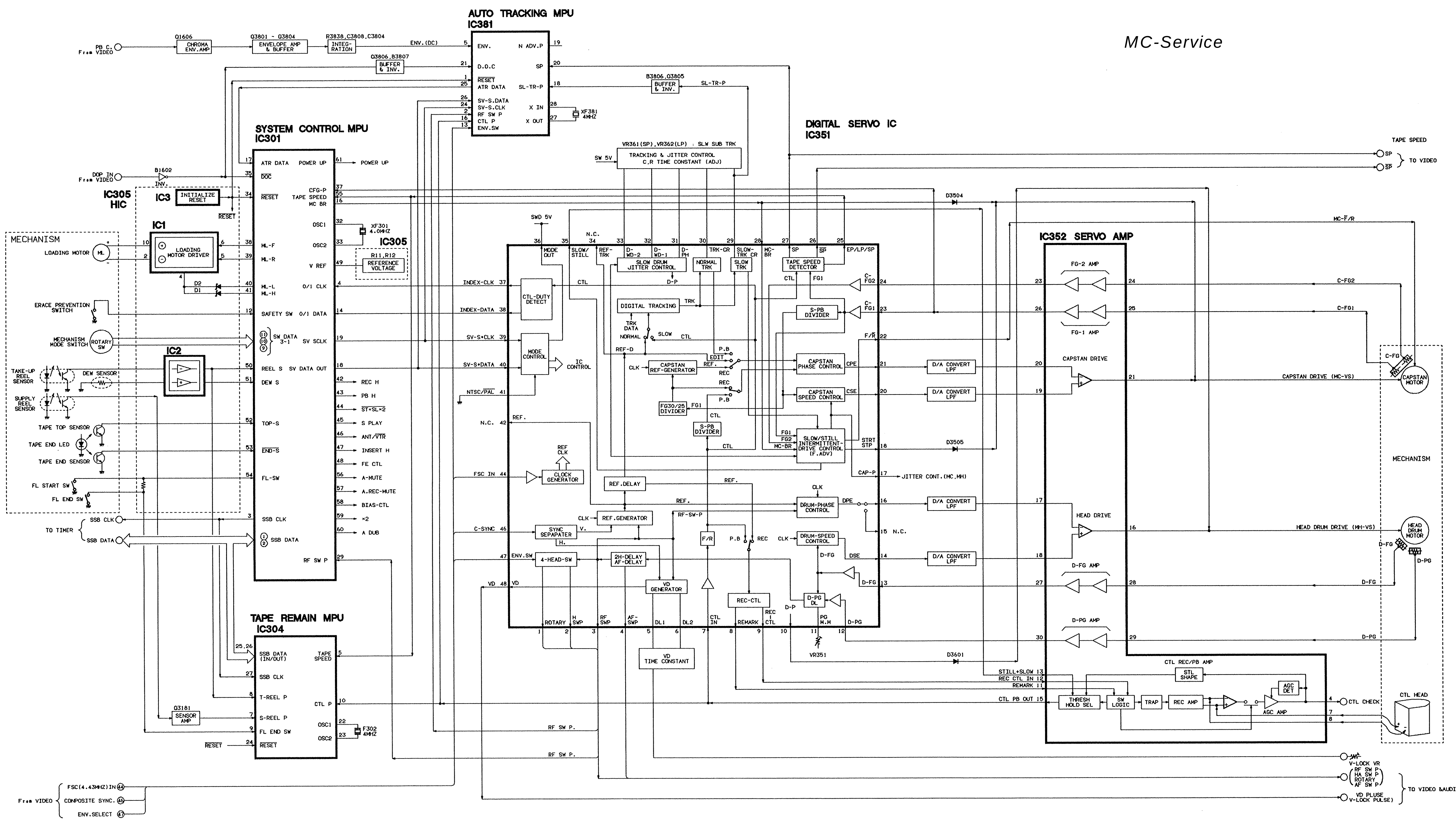
DM-1 ANALOG PROCESS FOR DIGITAL MEMORY (MAIN BOARD)
IC474 (2/2) PARENT/CHILD INPUT SELECT
IC474 (2/2) PAL CHROMA ENCODER & Y/C SWITCH
IC473 (3/3) PINP WG INSERT
IC473 (1/3) MEMORY W/R CONTROL SIG. GENERATOR
IC473 (2/3)
IC472 (INV.)
IC477 PAL CHROMA DEMODULATOR
(CHILD Y/C OUT) (TO MEMORY)
(CHILD Y/C IN) (FROM MEMORY)
PARENT VIDEO
CHILD VIDEO
PARENT CHROMA
DIGITAL V. OUT
TO VIDEO CIRCUIT
DM-3 DIGITAL MEMORY CIRCUIT BLOCK
IC3 A/D CONVERTER
IC4 D/A CONVERTER (Y)
IC5 D/A CONVERTER (R-Y)
IC6 D/A CONVERTER (B-Y)
IC1 MEMORY CONTROL GATE ARRAY
IC2 MEMORY (320×256×6bit) 0.5M DRAM
CHILD PICTURE SYNCHRONIZATION BLOCK
PARENT PICTURE SYNCHRONIZATION BLOCK
OPERATION CONTROL BLOCK
WRITE TIMING-SIG GENERATION BLOCK
MEMORY CONTROL BLOCK
READ TIMING-SIG GENERATION BLOCK
DM-4 MEMORY CONTROL BLOCK
IC752 (1/2)
IC752 (2/2)
IC751 DIGITAL SUB MPU
SYSTEM CONTROL CIRCUIT
AUDIO/VIDEO SIGNAL SELECT

MECHANISM CONNECTION CIRCUIT

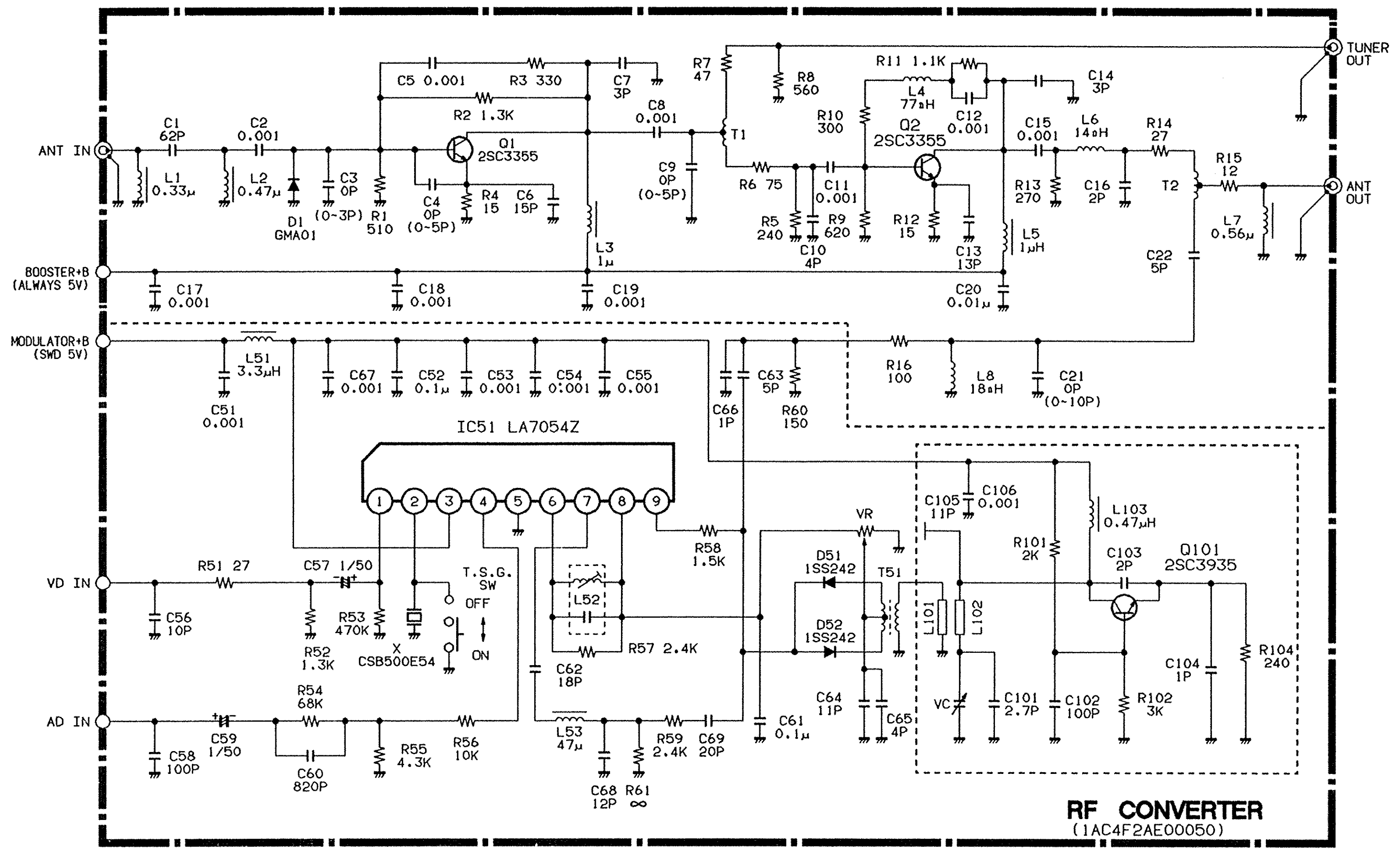


CN831
T.S. LED
GND
MC-4
CN801
T.S. LED
GND
FL STOP
E.P
S.VHS
FL START
MC-1
R8001
R8002
CN802
GND
S.VHS SW
E.P SW
FL STOP SW
S REEL P
SWD 5V
T REEL P
T REEL SENSOR
CN811
T TOP SENSOR
GND
T END SENSOR
GND
FL START SW
GND
CN816
GND
S.VHS SW
E.P SW
FL STOP SW
S REEL P
SWD 5V
T REEL P
CN817
ALWAYS 13V
GND (MH)
GND (MC)
TO PW-1 CN511
CN812
GND
FL START SW
T END SENSOR
T TOP SENSOR
S.VHS SW
E.P SW
FL STOP SW
S REEL P
SWD 5V
T REEL P
MC F/R
MC SERVO
MC FG2
GND
MC FG1
SWD 5V
MH PG
GND
MH FG
MH SERVO
DEW SENSOR
SW D2
SW D1
SW D3
ML +
ML -
TO CP-A CN301
CN815
MC F/R
MC SERVO
MC FG2
GND
MC FG1
SWD 5V
ALWAYS 13V
GND (MC)
CAPSTAN MOTOR
MC
CN814
MH PG
GND
MH FG
ALWAYS 13V
MH SERVO
GND (MH)
HEAD MOTOR
MH
MODE DETECT SWITCH
CN823
GND
SW D2
SW D1
SW D3
ML +
ML -
DEW SENSOR
CN813
ML
LOADING MOTOR
CN821
DEW SENSOR
GND
DEW SENSOR
MC-3
MC-2

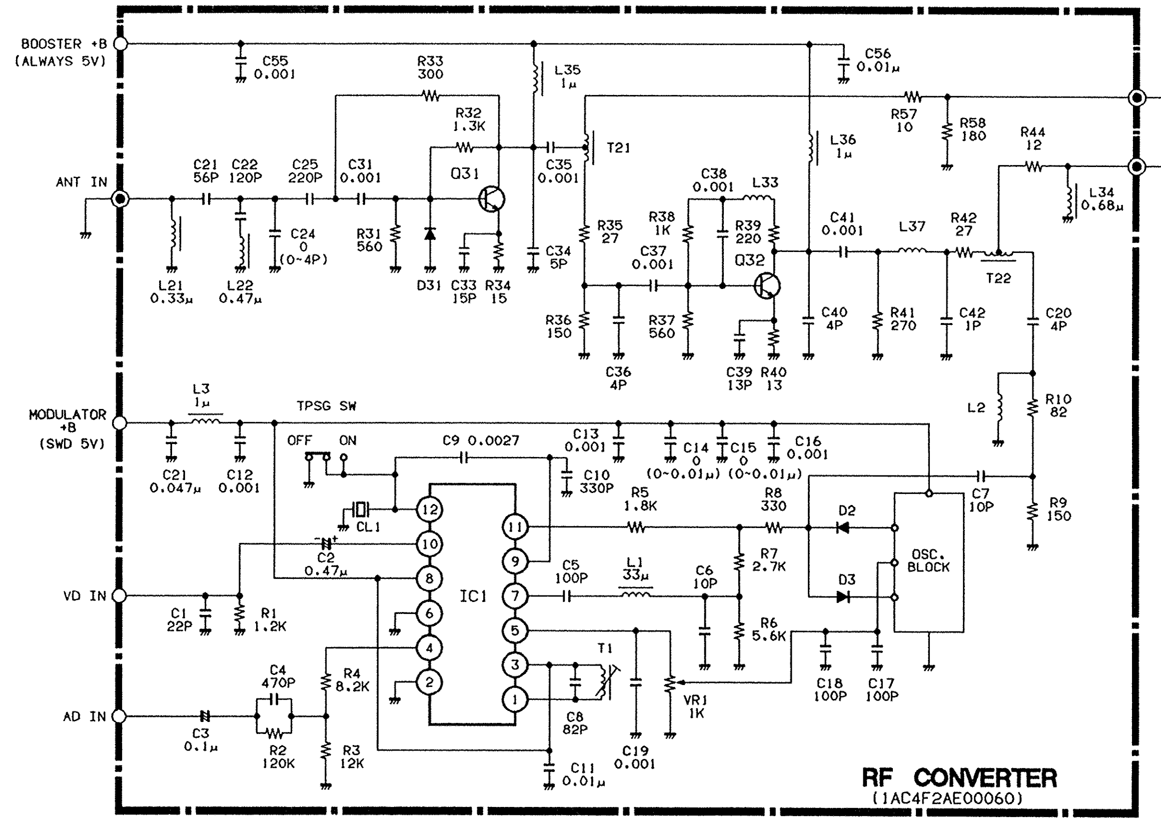
SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM


AUTO TRACKING MPU
IC381
SYSTEM CONTROL MPU
IC301
DIGITAL SERVO IC
IC351
IC352 SERVO AMP
TAPE REMAIN MPU
IC304
IC305
HIC
IC3
INITIALIZE RESET
IC1
LOADING MOTOR DRIVER
IC2
MECHANISM
LOADING MOTOR
ERACE PREVENTION SWITCH
MECHANISM MODE SWITCH
TAKE-UP REEL SENSOR
SUPPLY REEL SENSOR
DEW SENSOR
TAPE TOP SENSOR
TAPE END LED
TAPE END SENSOR
FL START SW
FL END SW
TO TIMER
SSB CLK
SSB DATA
PB C. From VIDEO
CHROMA ENV.AMP
ENVELOPE AMP & BUFFER
INTEGRATION
BUFFER & INV.
DOP IN From VIDEO
REFERENCE VOLTAGE
POWER UP
TAPE SPEED
TO VIDEO
TRACKING & JITTER CONTROL C.R TIME CONSTANT (ADJ)
SLOW DRUM JITTER CONTROL
DIGITAL TRACKING
CAPSTAN REF.GENERATOR
CAPSTAN PHASE CONTROL
CAPSTAN SPEED CONTROL
TAPE SPEED DETECTOR
S-PB DIVIDER
FG30/25 DIVIDER
SLOW/STILL INTERMITTENT DRIVE CONTROL (F.ADV)
CTL-DUTY DETECT
MODE CONTROL
IC CONTROL
CLOCK GENERATOR
REF.DELAY
REF.GENERATOR
SYNC SEPARATOR
4-HEAD-SW
2H-DELAY AF-DELAY
VD GENERATOR
VD TIME CONSTANT
DRUM-PHASE CONTROL
DRUM-SPEED CONTROL
REC-CTL
D/A CONVERT LPF
FG-2 AMP
FG-1 AMP
CAPSTAN DRIVE
HEAD DRIVE
D-FG AMP
D-PG AMP
CAPSTAN MOTOR
HEAD DRUM MOTOR
CTL HEAD
CTL REC/PB AMP
STL SHAPE
THRESH HOLD SEL
SW LOGIC
TRAP
REC AMP
AGC DET
AGC AMP
SENSOR AMP
JITTER CONT.(MC,MH)
CAPSTAN DRIVE (MC-VS)
HEAD DRUM DRIVE (MH-VS)
CTL CHECK
V-LOCK VR
TO VIDEO &AUDIO
FSC(4.43MHZ)IN
COMPOSITE SYNC.
ENV.SELECT
From VIDEO
VR351

RF CONVERTER CIRCUIT


ANT IN
BOOSTER+B (ALWAYS 5V)
MODULATOR+B (SW5 5V)
VD IN
AD IN
TUNER OUT
ANT OUT
Q1 2SC3355
Q2 2SC3355
D1 GMA01
IC51 LA7054Z
D51 1SS242
D52 1SS242
Q101 2SC3935
X CSB500E54
T.S.G. SW
OFF
ON
RF CONVERTER
(1AC4F2AE00050)

RF CONVERTER CIRCUIT

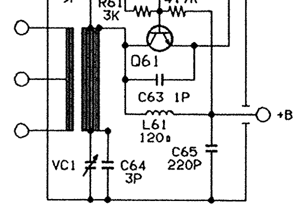

BOOSTER +B (ALWAYS 5V)
ANT IN
MODULATOR +B (SW5 5V)
VD IN
AD IN
TUNER OUT
ANT OUT
Q31
Q32
IC1
OSC. BLOCK
TPSG SW
OFF
ON
RF CONVERTER
(1AC4F2AE00060)

NOTE

IC1 : AJ7080

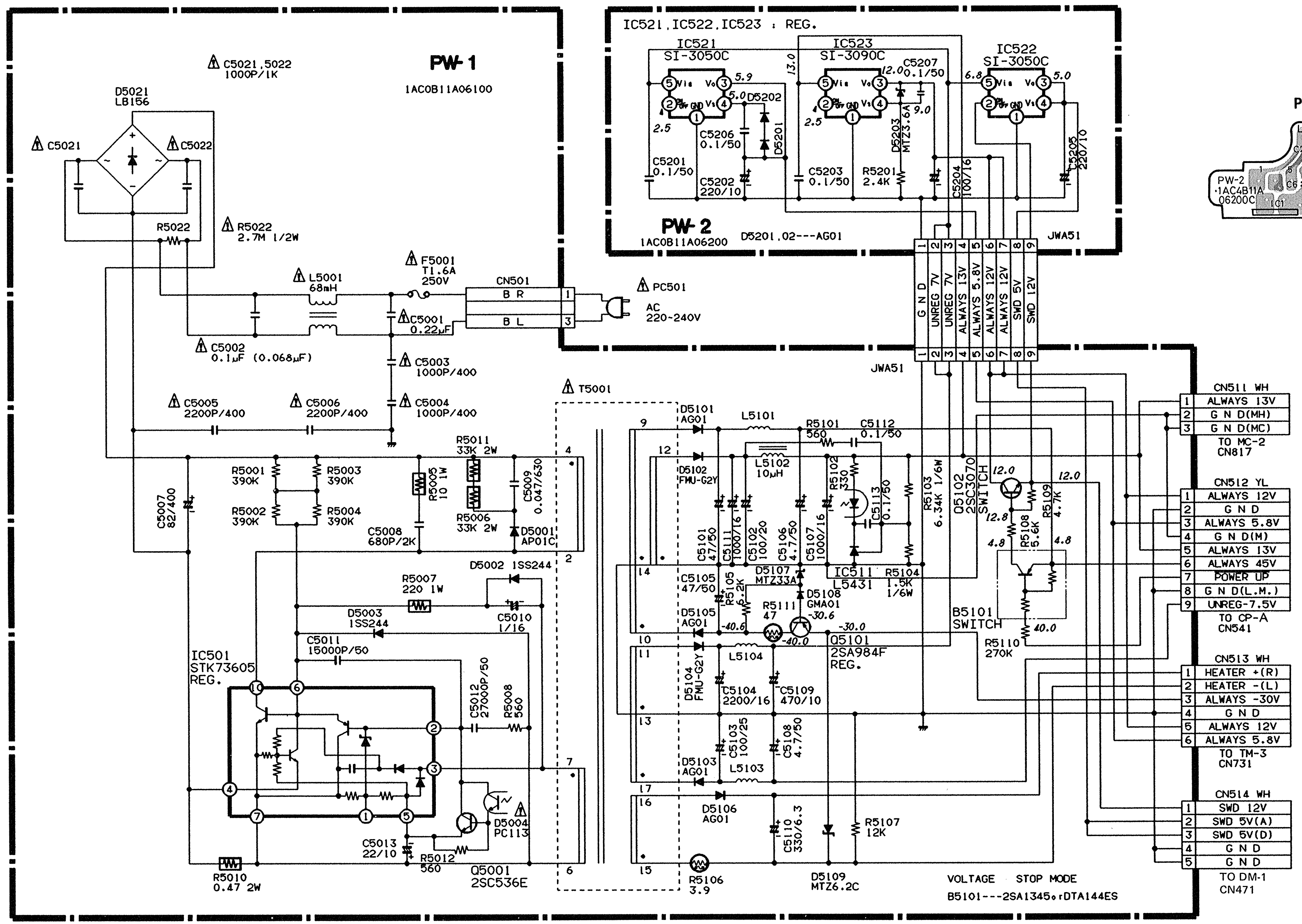
Q61 : 2SC2480 OR EQUIVALENT
D2.D3 : HSM276 OR EQUIVALENT
D31 : 1SS133.1SS83 OR EQUIVALENT

OSC BLOCK


C61 9P
C62 150P
R62 4.7K
R64 120
R61 3K
Q61
C63 1P
L61 120n
C65 220P
VC1
C64 3P
+B

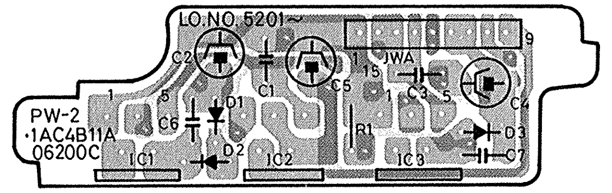
F VHR-D4890E

COMPL. PW-1, 2 POWER SUPPLY CIRCUIT



PW-1
1AC0B11A06100
PW-2
1AC0B11A06200
IC521, IC522, IC523 : REG.
IC521 SI-3050C
IC523 SI-3090C
IC522 SI-3050C
D5201,02---AG01
D5021 LB156
C5021, 5022 1000P/1K
R5022 2.7M 1/2W
L5001 68mH
F5001 T1.6A 250V
CN501
PC501 AC 220-240V
C5001 0.22µF
C5002 0.1µF (0.068µF)
C5003 1000P/400
C5004 1000P/400
C5005 2200P/400
C5006 2200P/400
T5001
R5011 33K 2W
R5001 390K
R5002 390K
R5003 390K
R5004 390K
C5008 680P/2K
R5006 33K 2W
D5001 AP01C
C5007 82/400
R5007 220 1W
D5002 1SS244
D5003 1SS244
C5011 15000P/50
IC501 STK73605 REG.
C5012 27000P/50
R5008 560
C5013 22/10
R5012 560
Q5001 2SC536E
D5004 PC113
R5010 0.47 2W
D5101 AG01
L5101
R5101 560
C5112 0.1/50
D5102 FMU-G2Y
L5102 10µH
D5107 MTZ33A
IC5101 L5431
R5104 1.5K 1/6W
Q5102 2SC3070 SWITCH
R5109 4.7K
R5108 5.6K
B5101 SWITCH
R5110 270K
D5108 GMA01
R5111 47
Q5101 2SA984F REG.
D5104 FMU-G2Y
L5104
C5104 2200/16
C5109 470/10
D5103 AG01
L5103
D5106 AG01
D5109 MTZ6.2C
R5107 12K
R5106 3.9
JWA51
GND
UNREG 7V
UNREG 13V
ALWAYS 5.8V
ALWAYS 13V
ALWAYS 12V
SWAYS 5V
SWD 12V
CN511 WH
ALWAYS 13V
GND(MH)
GND(MC)
TO MC-2 CN817
CN512 YL
ALWAYS 12V
GND
ALWAYS 5.8V
GND(M)
ALWAYS 45V
POWER UP
GND(L.M.)
UNREG-7.5V
TO CP-A CN541
CN513 WH
HEATER +(R)
HEATER -(L)
ALWAYS -30V
GND
ALWAYS 12V
ALWAYS 5.8V
TO TM-3 CN731
CN514 WH
SWD 12V
SWD 5V(D)
SWD 5V(A)
GND
GND
TO DM-1 CN471
VOLTAGE STOP MODE
B5101---2SA1345 or DTA144ES

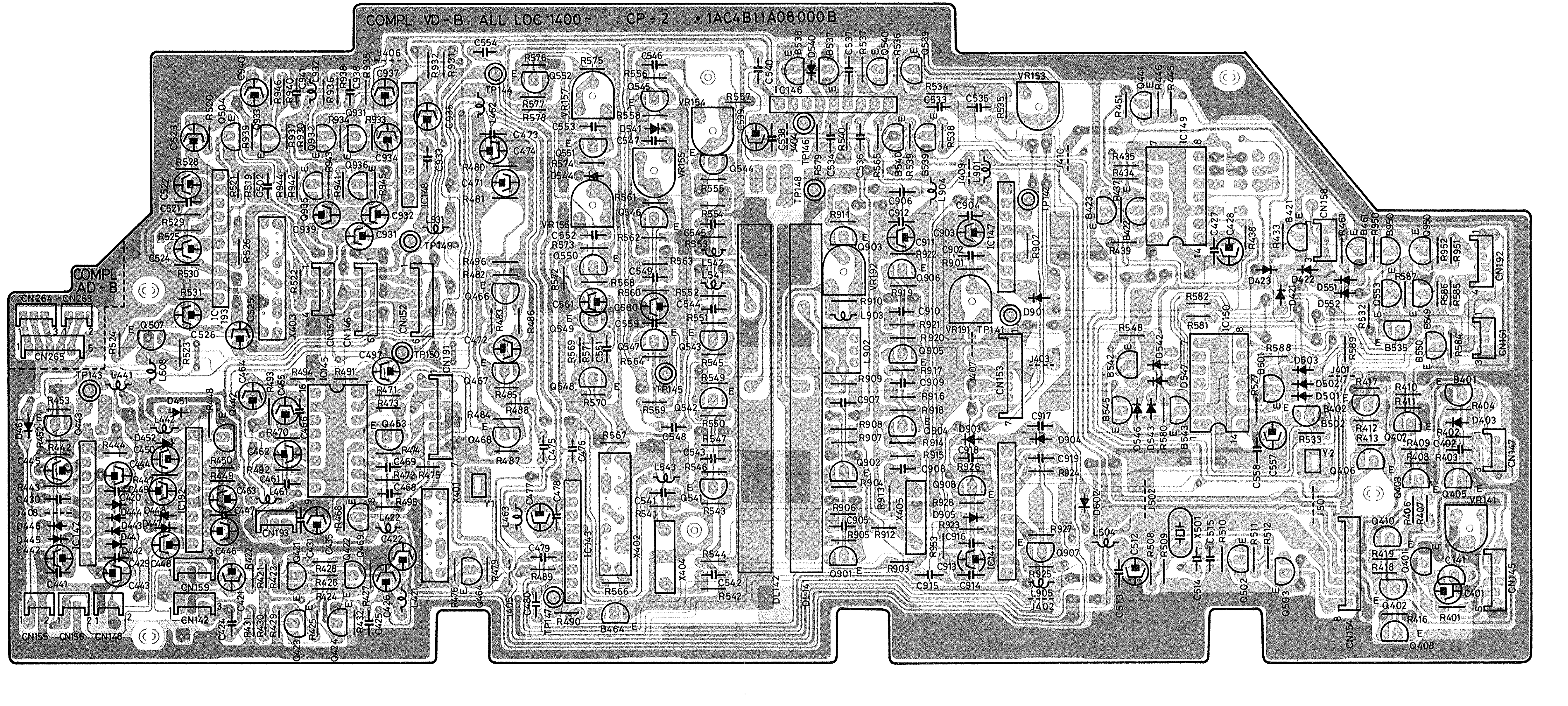
PW-2 POWER SUPPLY P.C.B.



LO.NO.5201
PW-2 1AC4B11A 06200C

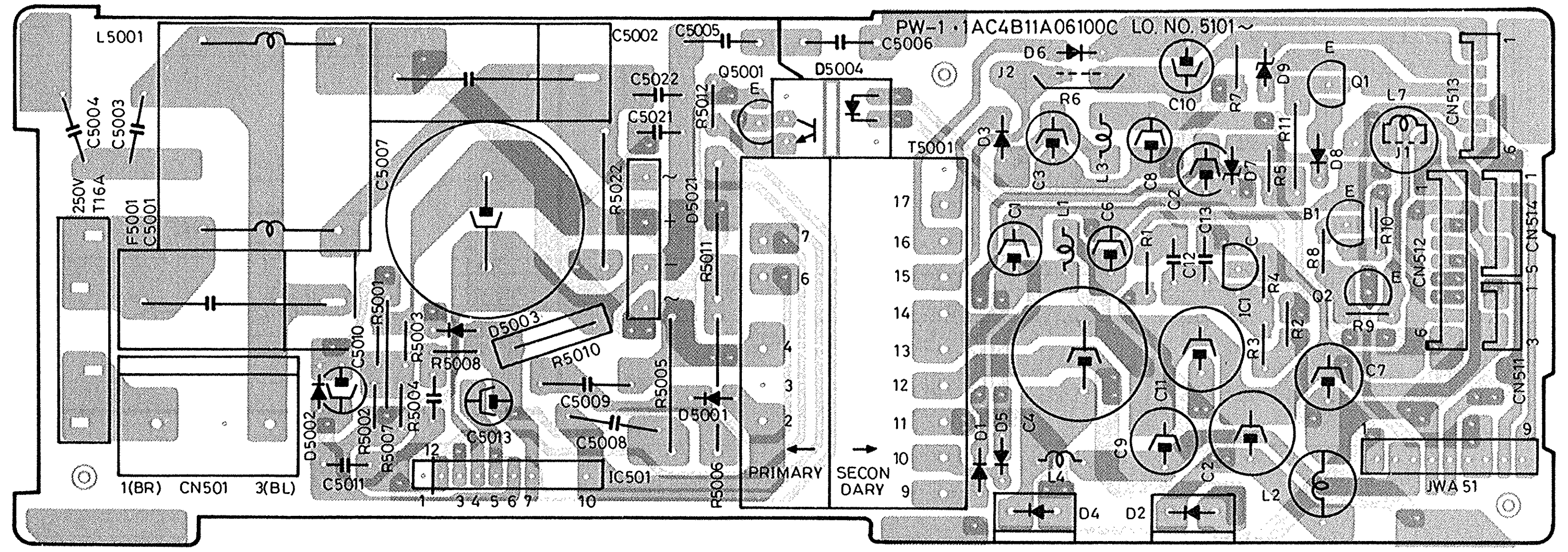
MC-Service

CP-2 VIDEO (1) P.C.B.



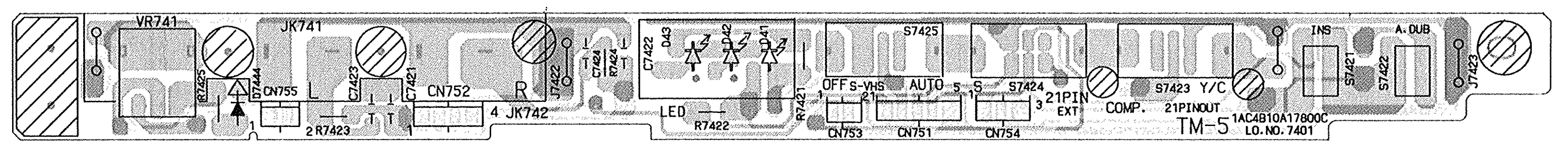
COMPL VD-B ALL LOC.1400~ CP-2 1AC4B11A08000B
COMPL AD-B

PW-1 POWER SUPPLY P.C.B.

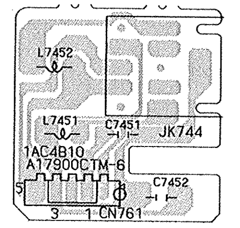


PW-1 1AC4B11A06100C LO.NO.5101~
PRIMARY
SECONDARY
CN501
JWA51

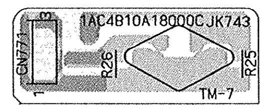
TM-5 SWITCH & AUDIO INPUT TERMINAL P.C.B.



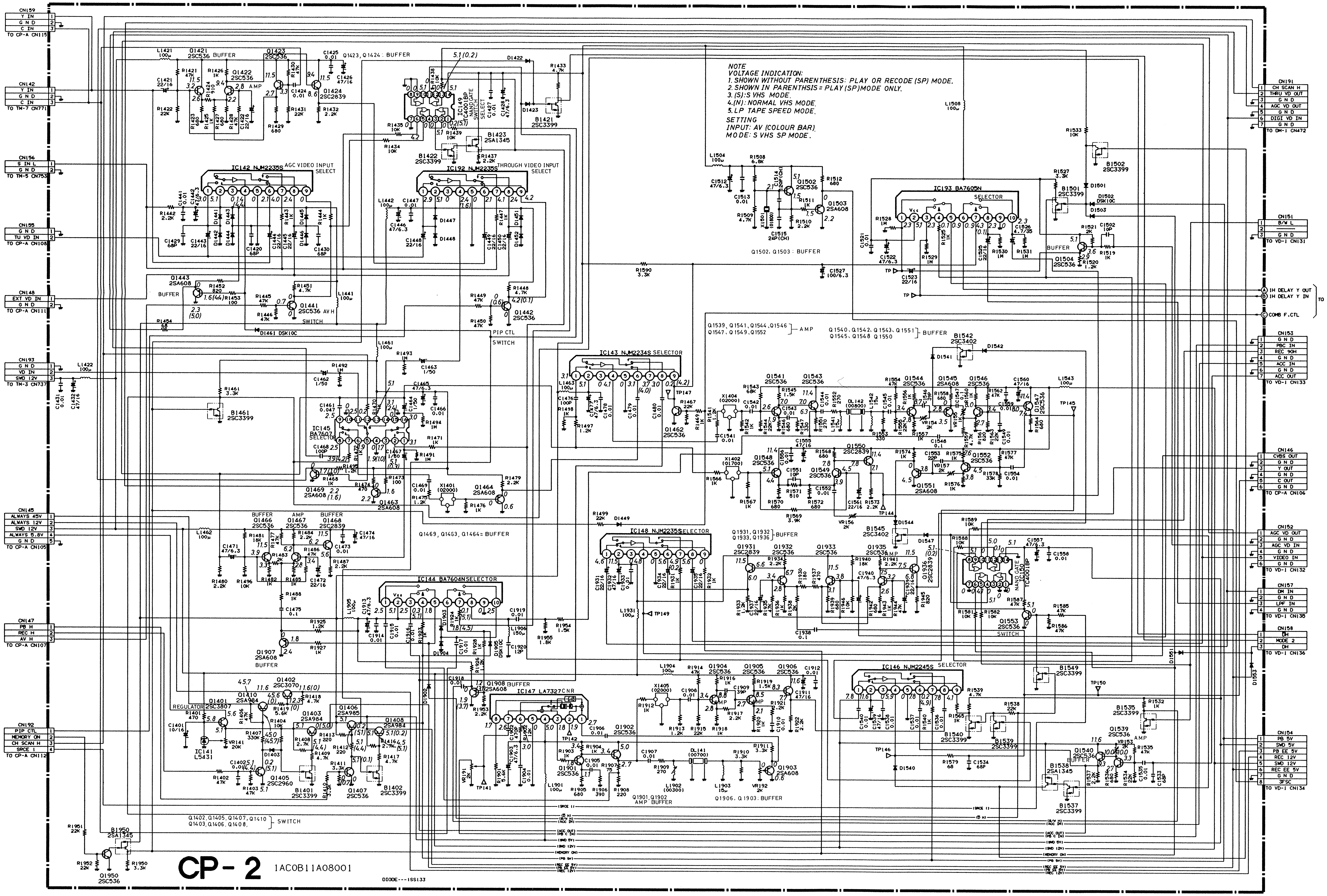
TM-6 MIC. JACK P.C.B.



TM-7 S. INPUT TERMINAL P.C.B.

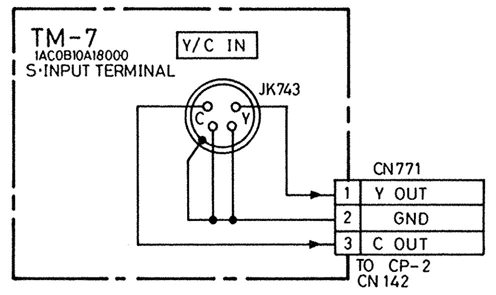


COMPL. CP-2 VIDEO (1) CIRCUIT

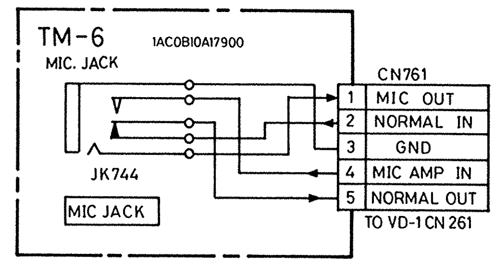

CN159
Y IN
G N D
C IN
TO CP-A CN115
CN142
Y IN
G N D
C IN
TO TM-7 CN771
CN156
S IN L
G N D
TO TM-5 CN753
CN155
G N D
TU VD IN
TO CP-A CN108
CN148
EXT VD IN
G N D
TO CP-A CN111
CN193
G N D
VD IN
SWD 12V
TO TM-3 CN737
CN145
ALWAYS 45V
ALWAYS 12V
SWD 12V
ALWAYS 5.6V
G N D
TO CP-A CN105
CN147
PB H
REC H
AV H
TO CP-A CN107
CN192
PIP CTL
MEMORY ON
CH SCAN H
SRCE 1
TO CP-A CN112
CN191
CH SCAN H
THRU VD OUT
G N D
AGC VD OUT
G N D
DIGI VD IN
G N D
TO DM-1 CN472
CN151
B/W L
G N D
TO VD-1 CN131
1H DELAY Y OUT
1H DELAY Y IN
COMB F.CTL
TO VD-1
CN153
G N D
PBC IN
REC 90H
G N D
ACC IN
G N D
ACC OUT
TO VD-1 CN133
CN146
CVBS OUT
G N D
Y OUT
G N D
C OUT
G N D
TO CP-A CN106
CN152
AGC VD OUT
G N D
AGC VD IN
G N D
VIDEO IN
G N D
TO VD-1 CN132
CN157
DM IN
G N D
LPF IN
G N D
TO VD-1 CN135
CN158
DH
MODE 2
DH
TO VD-1 CN136
CN154
PB 5V
SWD 5V
PB EE 5V
REC 12V
SWD 12V
REC EE 5V
G N D
3FSC
TO VD-1 CN134
Q1421 2SC536 BUFFER
Q1422 2SC536 AMP
Q1423 2SC536
Q1424 2SC2839
Q1423, Q1424 : BUFFER
IC149 TC4001BP NAND GATE SWITCH SELECT
B1421 2SC3399
B1422 2SC3399
B1423 2SA1345
IC142 NJM2235S AGC VIDEO INPUT SELECT
IC192 NJM2235S THROUGH VIDEO INPUT SELECT
Q1443 2SA608 BUFFER
Q1441 2SC536 AV H SWITCH
Q1442 2SC536
PIP CTL SWITCH
D1461 DSK10C
B1461 2SC3399
IC145 BA7602 SELECTOR
Q1469 2SA608
Q1463 2SA608
Q1464 2SA608
Q1469, Q1463, Q1464 : BUFFER
Q1466 2SC536 BUFFER
Q1467 2SC536 AMP
Q1468 2SC2839 BUFFER
IC144 BA7604N SELECTOR
Q1907 2SA608 BUFFER
Q1401 2SC3807 REGULATOR
Q1410 2SA984
Q1402 2SC3070
Q1403 2SA984
Q1404
Q1405 2SC2960
Q1406 2SA985
Q1407 2SC536
Q1408 2SA984
B1401 2SC3399
B1402 2SC3399
IC141 L5431
Q1402, Q1405, Q1407, Q1410
Q1403, Q1406, Q1408 SWITCH
B1950 2SA1345
Q1950 2SC536
CP-2
1AC0B11A08001
DIODE---1SS133
IC147 LA7327 CNR
Q1908 2SA608 BUFFER
Q1901 2SC536
Q1902 2SC536
Q1901, Q1902 AMP BUFFER
Q1903 2SA608
Q1904 2SC536
Q1905 2SC536
Q1906 2SC536
Q1906, Q1903 : BUFFER
X1405 (02000)
DL141 (00700)
IC143 NJM2234S SELECTOR
Q1462 2SC536
X1404 (02000)
X1402 (01700)
X1401 (02000)
DL142 (00800)
Q1539, Q1541, Q1544, Q1546 AMP
Q1547, Q1549, Q1552
Q1540, Q1542, Q1543, Q1551 BUFFER
Q1545, Q1548, Q1550
B1542 2SC3402
Q1541 2SC536
Q1543 2SC536
Q1544 2SC536
Q1545 2SA608
Q1546 2SC536
Q1548 2SC536
Q1549 2SC536
Q1550 2SC2839
Q1551 2SA608
Q1552 2SC536
IC148 NJM2235S SELECTOR
Q1931, Q1932 BUFFER
Q1933, Q1935, Q1936
Q1931 2SC2839
Q1932 2SC536
Q1933 2SC536
Q1935 2SC536 AMP
Q1936 2SC536
B1545 2SC3402
IC190 TC4001BP NAND GATE
Q1553 2SC536 SWITCH
IC146 NJM2245S SELECTOR
B1549 2SC3399
B1540 2SC3399
B1539 2SC3399
B1535 2SC3399
Q1539 2SC536 AMP
Q1540 2SC536 BUFFER
B1538 2SA1345
B1537 2SC3399
Q1502 2SC536
Q1503 2SA608
Q1502, Q1503 : BUFFER
IC193 BA7605N SELECTOR
B1501 2SC3399
B1502 2SC3399
D1502 DSK10C
Q1504 2SC536 BUFFER
TP141
TP142
TP144
TP145
TP146
TP147
TP149
TP150

NOTE
VOLTAGE INDICATION:
1. SHOWN WITHOUT PARENTHESIS: PLAY OR RECODE (SP) MODE.
2. SHOWN IN PARENTHSIS = PLAY(SP)MODE ONLY.
3. (S): S VHS MODE.
4. (N): NORMAL VHS MODE.
5. LP TAPE SPEED MODE.
SETTING
INPUT: AV (COLOUR BAR)
MODE: S VHS SP MODE.

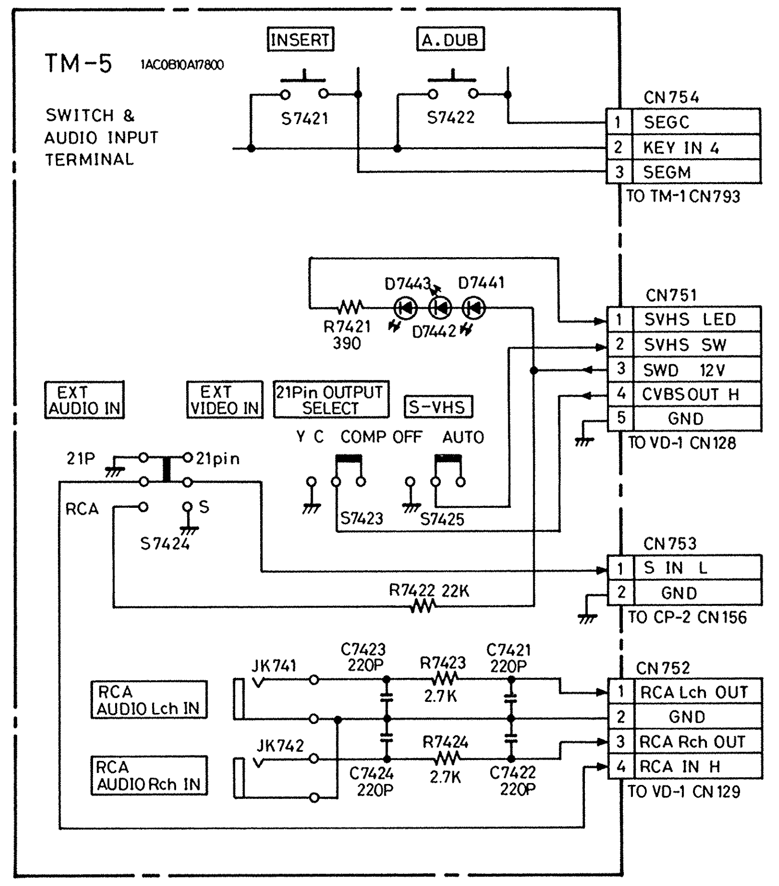
COMPL. TM-7 S. INPUT TERMINAL CIRCUIT


TM-7
1AC0B10A18000
S-INPUT TERMINAL
Y/C IN
JK743
CN771
Y OUT
GND
C OUT
TO CP-2 CN142

COMPL. TM-6 MIC. JACK CIRCUIT


TM-6
1AC0B10A17900
MIC. JACK
CN761
MIC OUT
NORMAL IN
GND
MIC AMP IN
NORMAL OUT
TO VD-1 CN261
JK744
MIC JACK

COMPL. TM-5 SWITCH & AUDIO INPUT TERMINAL P.C.B.


TM-5
1AC0B10A17800
SWITCH & AUDIO INPUT TERMINAL
INSERT
A.DUB
S7421
S7422
CN754
SEGC
KEY IN 4
SEGM
TO TM-1 CN793
D7443
D7441
D7442
R7421 390
CN751
SVHS LED
SVHS SW
SWD 12V
CVBSOUT H
GND
TO VD-1 CN128
EXT AUDIO IN
EXT VIDEO IN
21Pin OUTPUT SELECT
S-VHS
Y C COMP OFF AUTO
21P
21pin
RCA
S
S7424
S7423
S7425
R7422 22K
CN753
S IN L
GND
TO CP-2 CN156
JK741
JK742
RCA AUDIO Lch IN
RCA AUDIO Rch IN
C7423 220P
C7421 220P
R7423 2.7K
R7424 2.7K
C7424 220P
C7422 220P
CN752
RCA Lch OUT
GND
RCA Rch OUT
RCA IN H
TO VD-1 CN129

G
VHR-D4890E

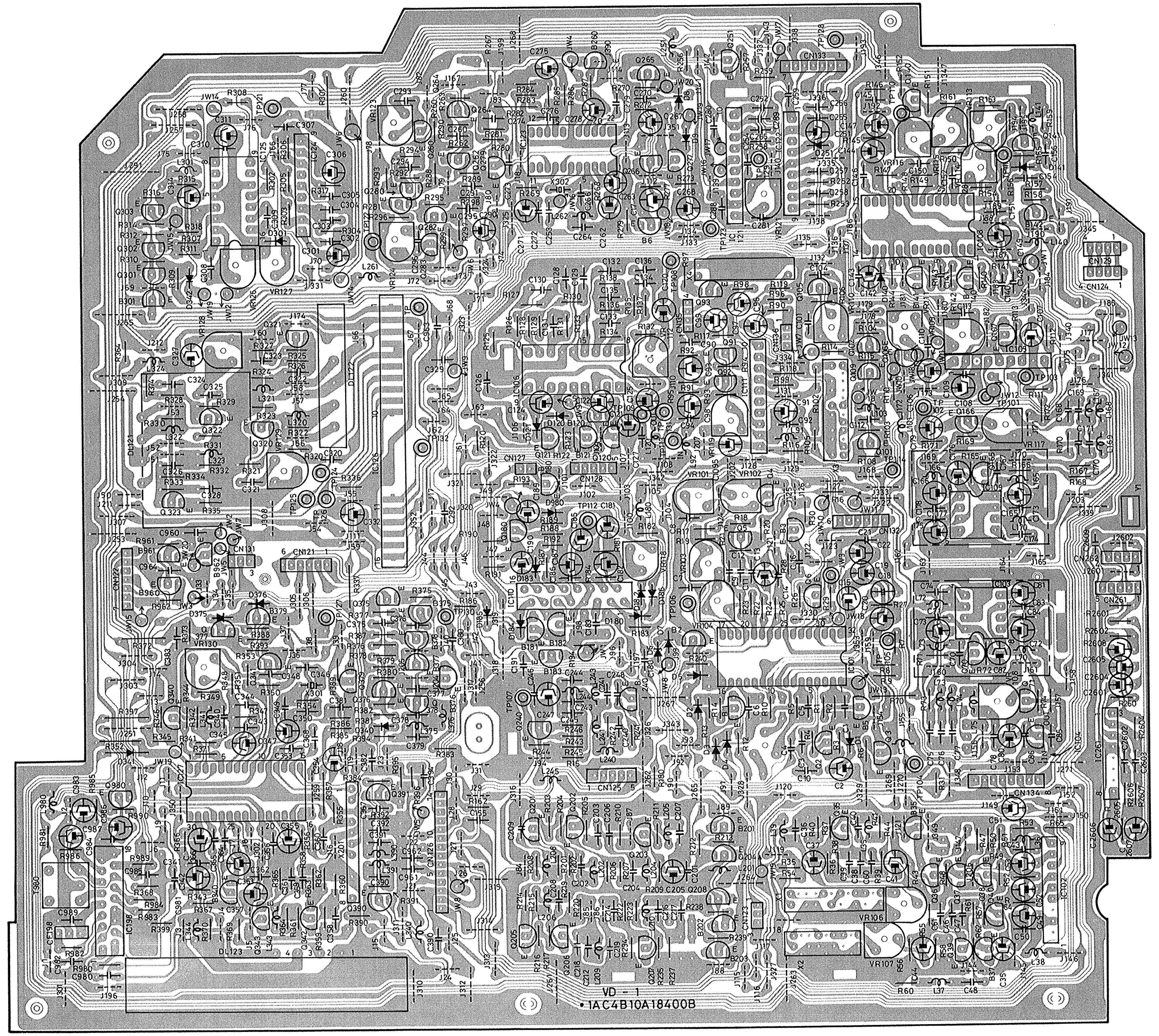
COMPL. VD-1 VIDEO (2) & MIC AMP. P.C.B.

NOTE
VOLTAGE INDICATION:
1. SHOWN WITHOUT PARENTHESIS: PLAY OR RECODE (SP) MODE.
2. SHOWN IN PARENTHSIS = PLAY (SP) MODE ONLY.
3. (S): S VHS MODE.
4. (N): NORMAL VHS MODE.
5. LP TAPE SPEED MODE.

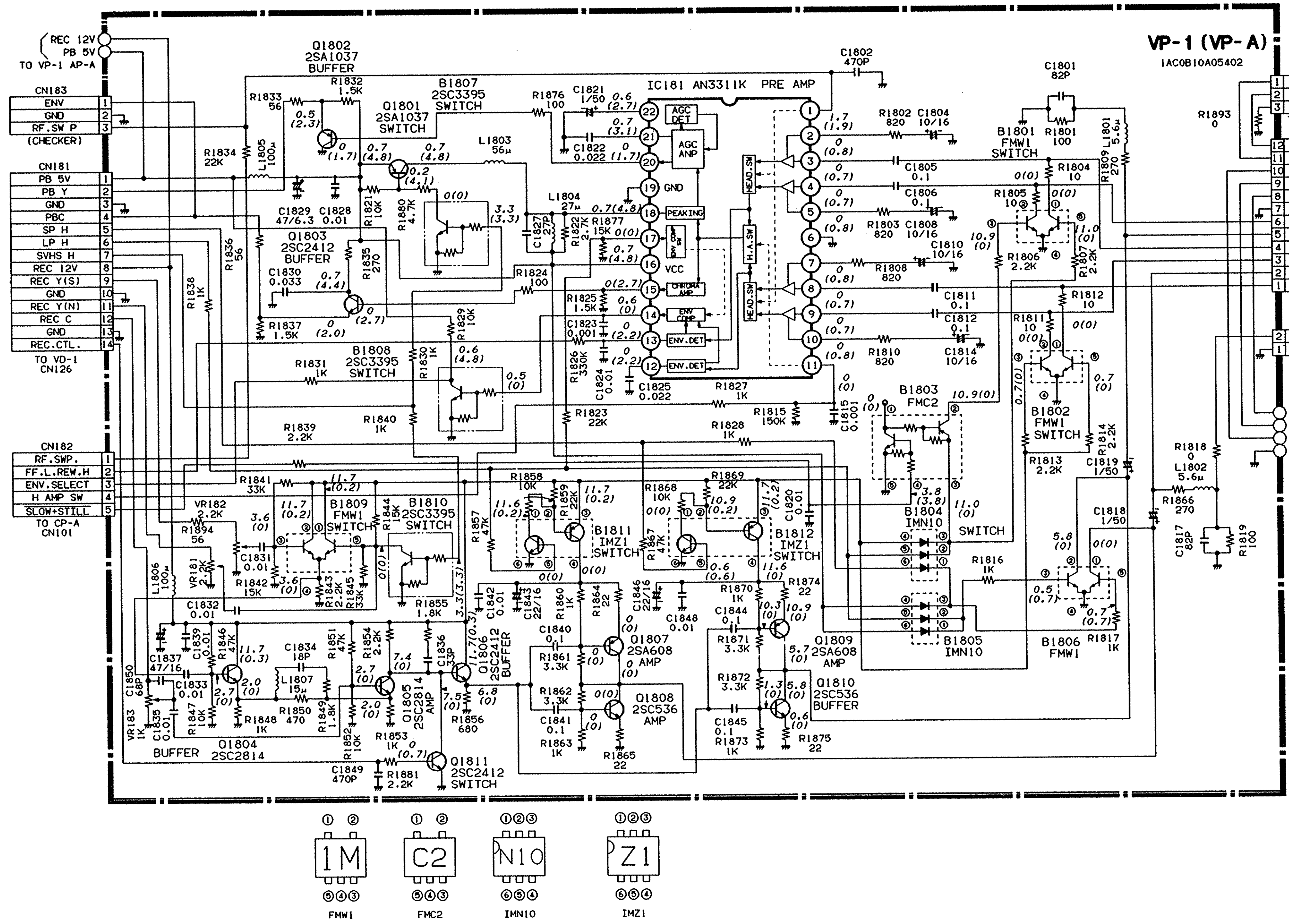
SETTING
INPUT: AV (COLOUR BAR)
MODE: S VHS SP MODE.

VD-1
1AC0B10A18403
MIC AMP
MC-Service
VHR-D4890E
IC101 BA7281
IC102 NJM2246S
IC103 MSM6957-RS
IC104 M5278L09
IC105 NJM2246S
IC106 VC2031
IC109 MSM6957-RS
IC110 LA7311
IC111 BA7605N
IC121 BA7604N
IC122 NJM2234S
IC123 AN6367K
IC124 TA7357P
IC125 TC4538BP
IC127 TA8632N
IC261 M5218L
CN111 CN121 CN122 CN123 CN124 CN125 CN126 CN127 CN128 CN129 CN131 CN132 CN133 CN134 CN135 CN136 CN261 CN262
TO VP-1 CN181
TO VD-3 CN175
TO CP-A CN104
TO CP-A CN102
TO CP-A CN103
TO CP-2 CN161
TO CP-2 CN158
TO CP-2 CN152
TO CP-2 CN157
TO TM-5 CN751
TO AD-1 CN225
TO CP-2 CN154
TO CP-2 CN153
TO TB-1 CN856
TO AD-2 CN213
TO TM-5 CN752
TO CP-A CN256
TO TM-6 CN761
TB-1 COMB FILTER ON OFF
PB PILOT BURST CLEANING
PILOT BURST INSERT
SWD 9V REGULATOR
B1960, Q1961, Q1962 : SWITCH
B1240, B1962, B1961, B1960 — SWITCH
Q1205~Q1207 : S VHS EQ AMP

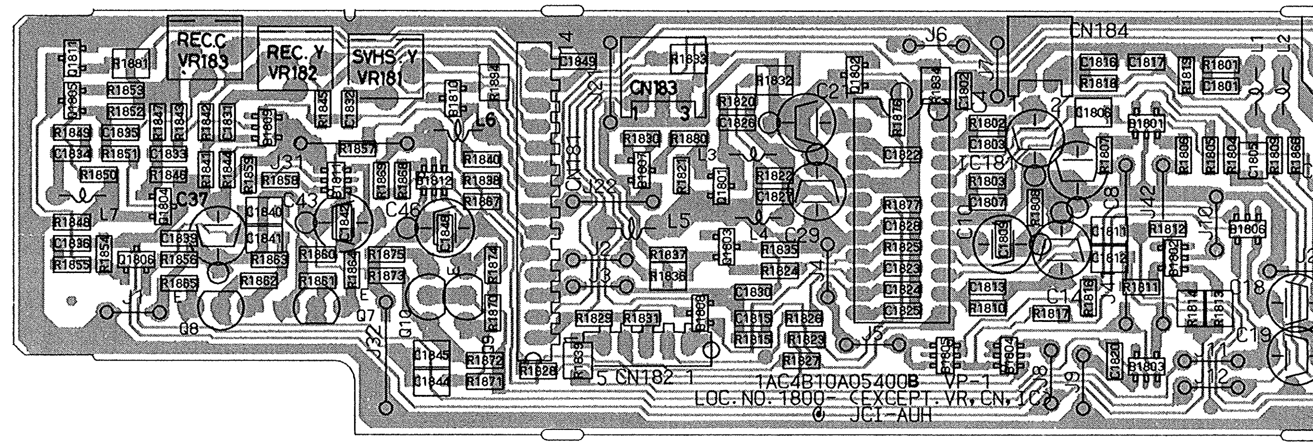
VD-1 VIDEO (2) & MIC AMP. P.C.B.


VD-1
1AC4B10A18400B

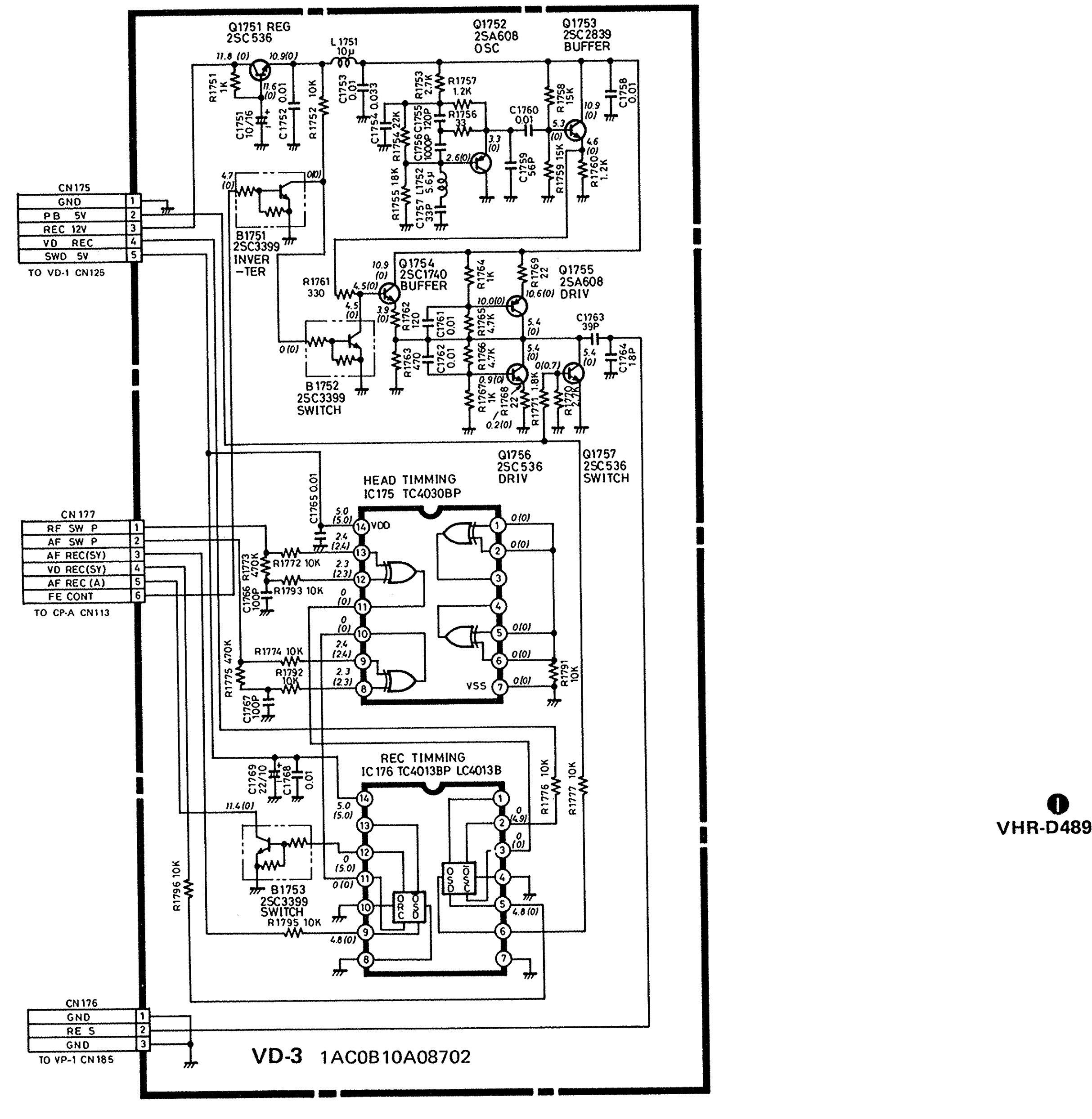
COMPL. VP-1 VIDEO PRE-AMP CIRCUIT


VP-1 (VP-A)
1AC0B10A05402
IC181 AN3311K PRE AMP
Q1801 2SA1037 SWITCH
Q1802 2SA1037 BUFFER
Q1803 2SC2412 BUFFER
Q1804 2SC2814 BUFFER
Q1807 2SA608 AMP
Q1808 2SC536 AMP
Q1809 2SA608 AMP
Q1810 2SC536 BUFFER
Q1811 2SC2412 SWITCH
CN181
CN182
CN183
CN184
CN185
CN186
TO VP-1 AP-A
TO VD-1 CN126
TO CP-A CN101
1M
C2
N10
Z1
FMW1
FMC2
IMN10
IMZ1

VP-1 VIDEO & AUDIO PRE-AMP P.C.B.

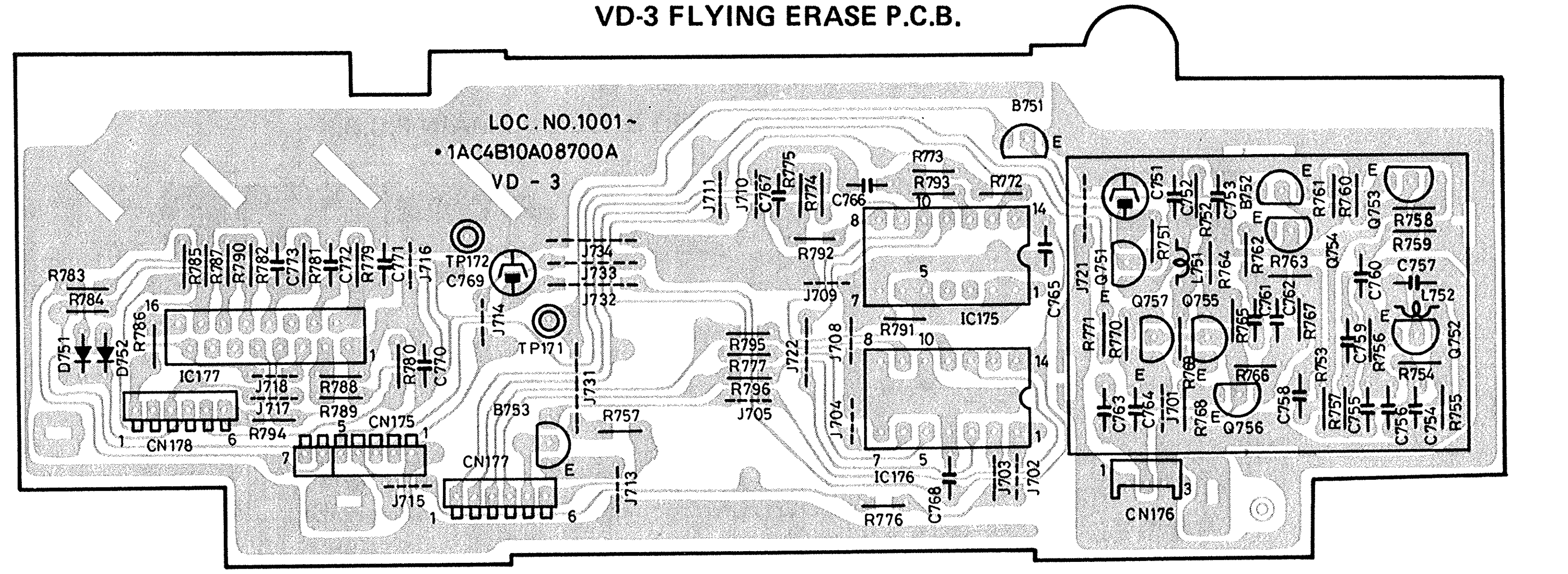

1AC4B10A05400B
VP-1

COMPL. VD-3 FLYING ERASE CIRCUIT


VD-3 1AC0B10A08702
Q1751 REG 2SC536
Q1752 2SA608 OSC
Q1753 2SC2839 BUFFER
Q1754 2SC1740 BUFFER
Q1755 2SA608 DRIV
Q1756 2SC536 DRIV
Q1757 2SC536 SWITCH
B1751 2SC3399 INVER-TER
B1752 2SC3399 SWITCH
B1753 2SC3399 SWITCH
HEAD TIMMING IC175 TC4030BP
REC TIMMING IC176 TC4013BP LC4013B
CN175
CN176
CN177
TO VD-1 CN125
TO CP-A CN113
TO VP-1 CN185
TO DRUM

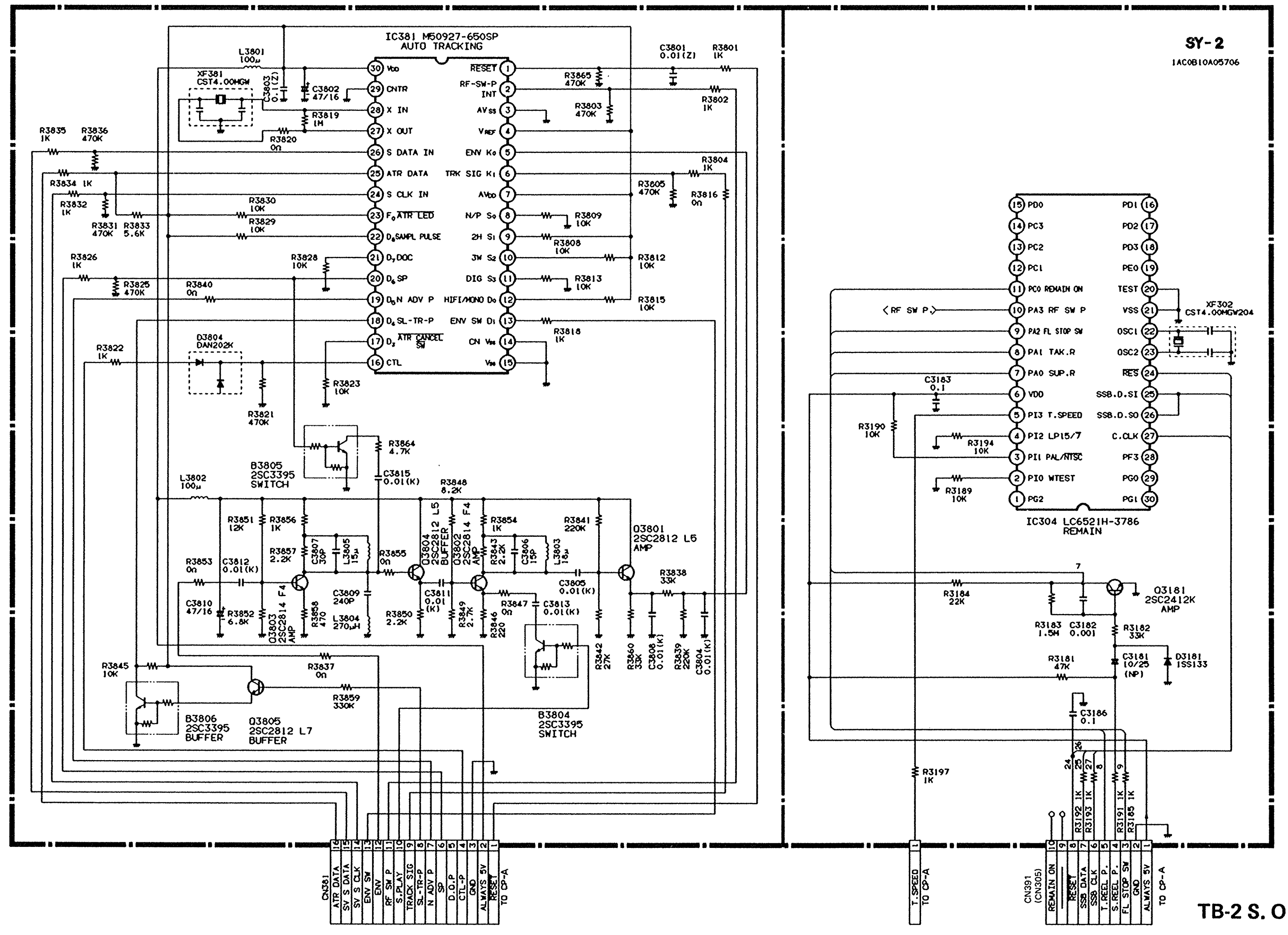
❶ VHR-D4890E

VD-3 FLYING ERASE P.C.B.

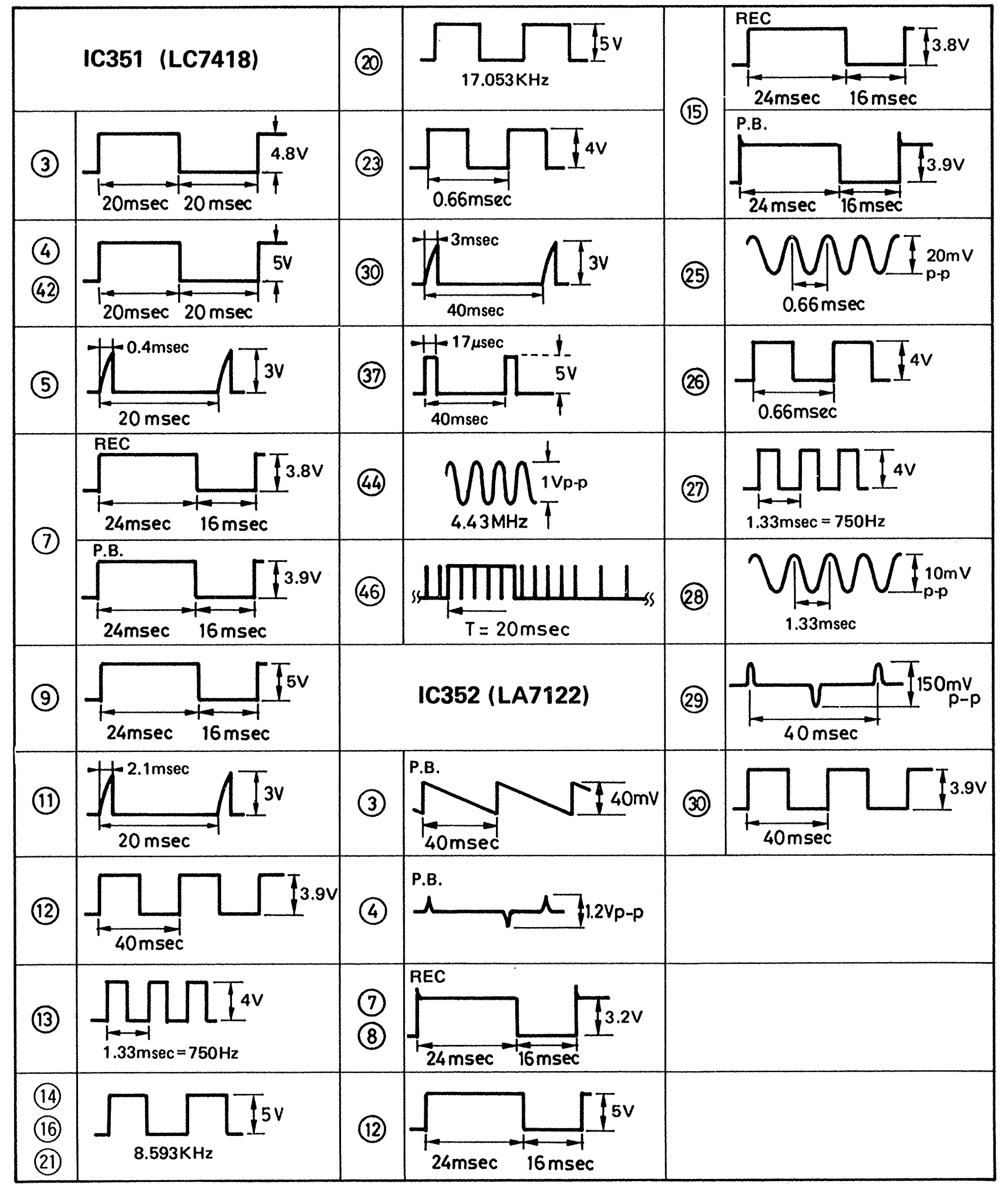

LOC. NO. 1001~
• 1AC4B10A08700A
VD-3
IC175
IC176
IC177
CN175
CN176
CN177
CN178

VHR-D4890E

COMPL. SY-2 AUTO TRACKING & TAPE REMAIN CIRCUIT

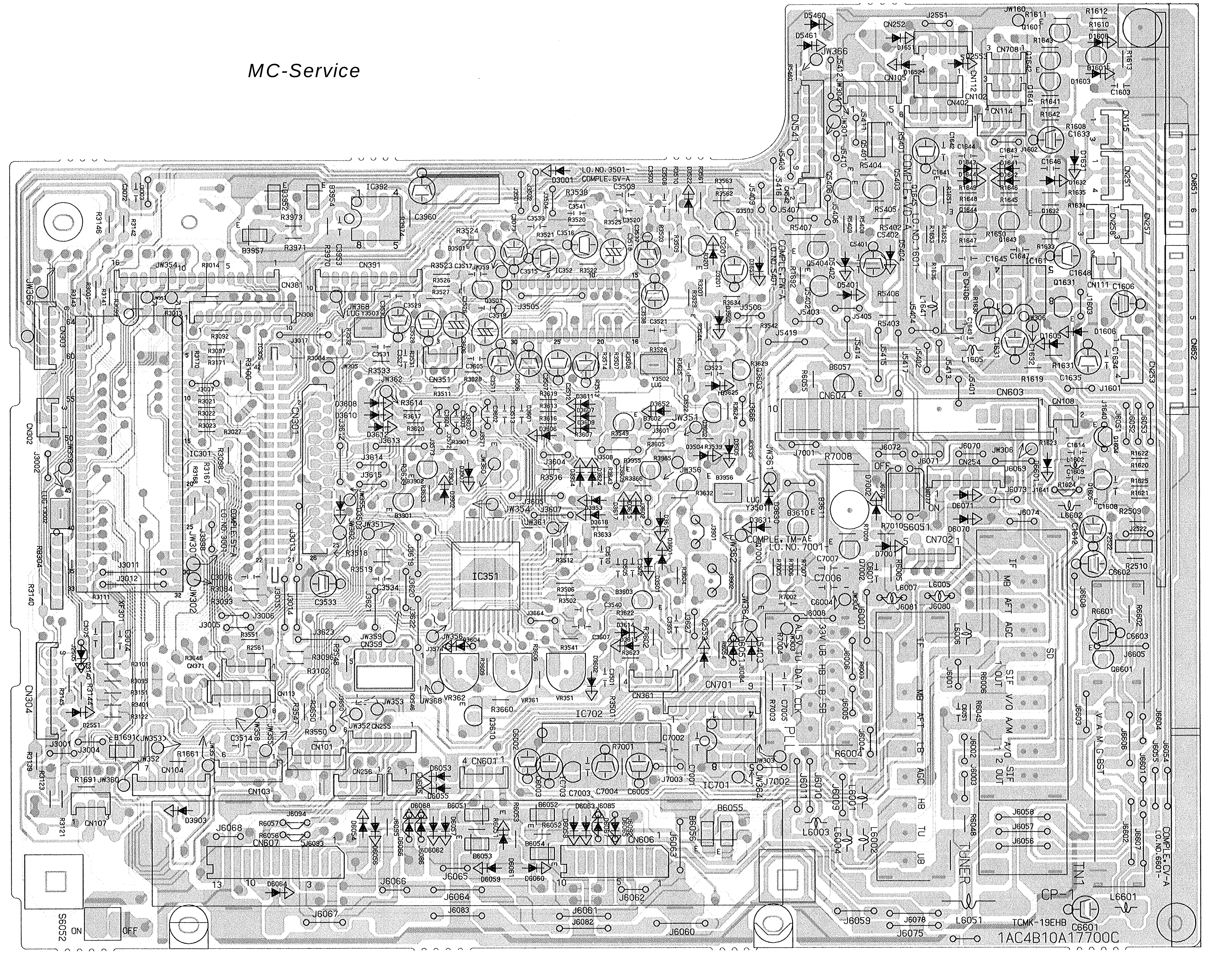

SY-2
1AC0B10A05706
IC381 M50927-650SP AUTO TRACKING
IC304 LC6521H-3786 REMAIN
Q3805 2SC2812 L7 BUFFER
Q3806 2SC3395 BUFFER
Q3804 2SC3395 SWITCH
Q3801 2SC2812 L5 AMP
Q3181 2SC2412K AMP
TO CP-A

WAVEFORM OF SERVO

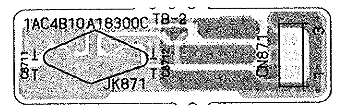


CP-A MAIN P.C.B.

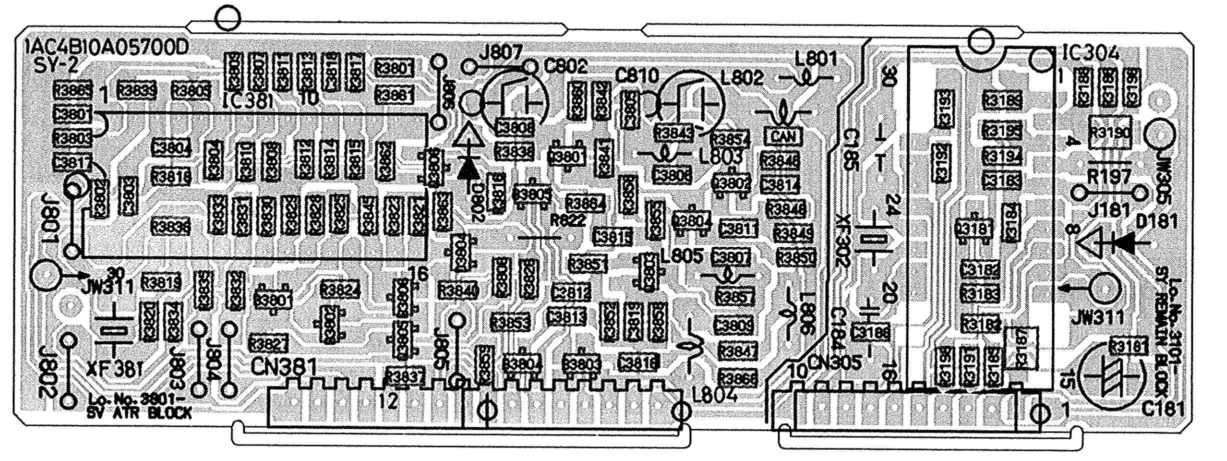
MC-Service


IC351
IC702
1AC4B10A17700C
TCMK-19EHB
TUNER
CP

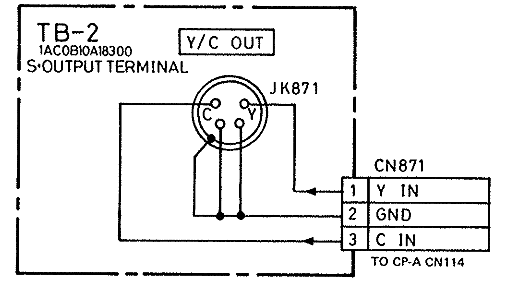
TB-2 S. OUTPUT TERMINAL P.C.B.


1AC4B10A18300C
JK871

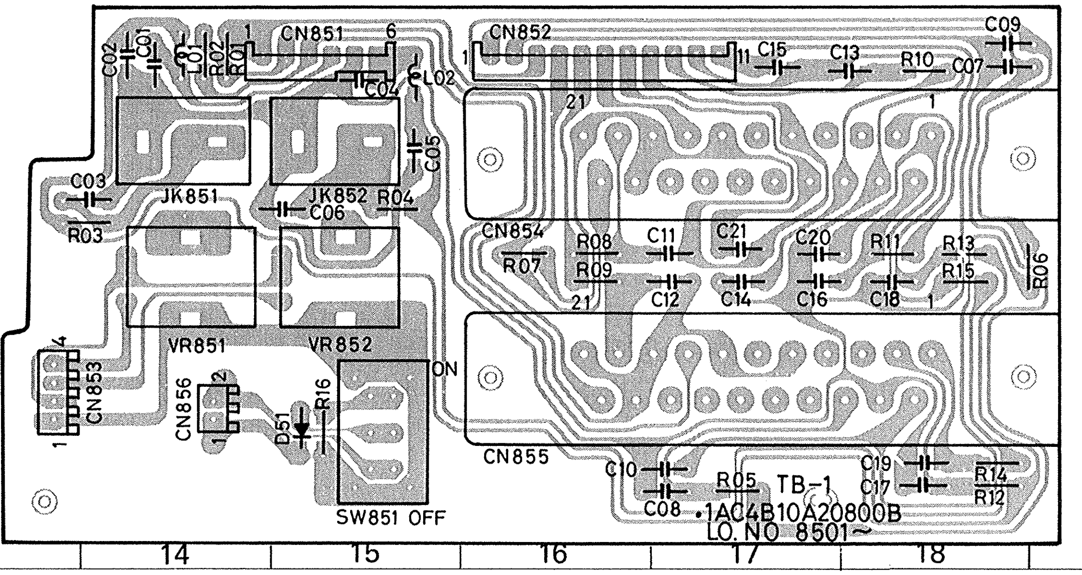
SY-2 AUTO TRACKING & TAPE REMAIN P.C.B.


1AC4B10A05700D
SY-2
IC381
IC304
CN381
CN305
XF381
Lo.No.3801
SY ATR BLOCK

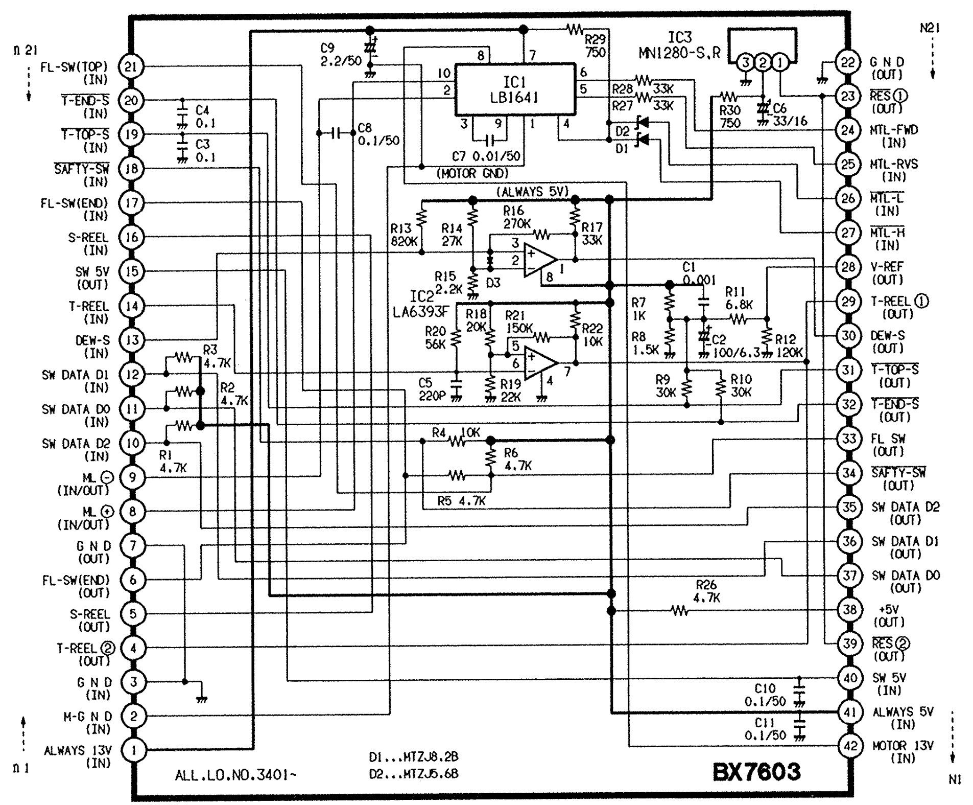
COMPL. TB-2 S. OUTPUT TERMINAL CIRCUIT


TB-2
1AC0B10A8300
S-OUTPUT TERMINAL
Y/C OUT
JK871
CN871
1 Y IN
2 GND
3 C IN
TO CP-A CN114

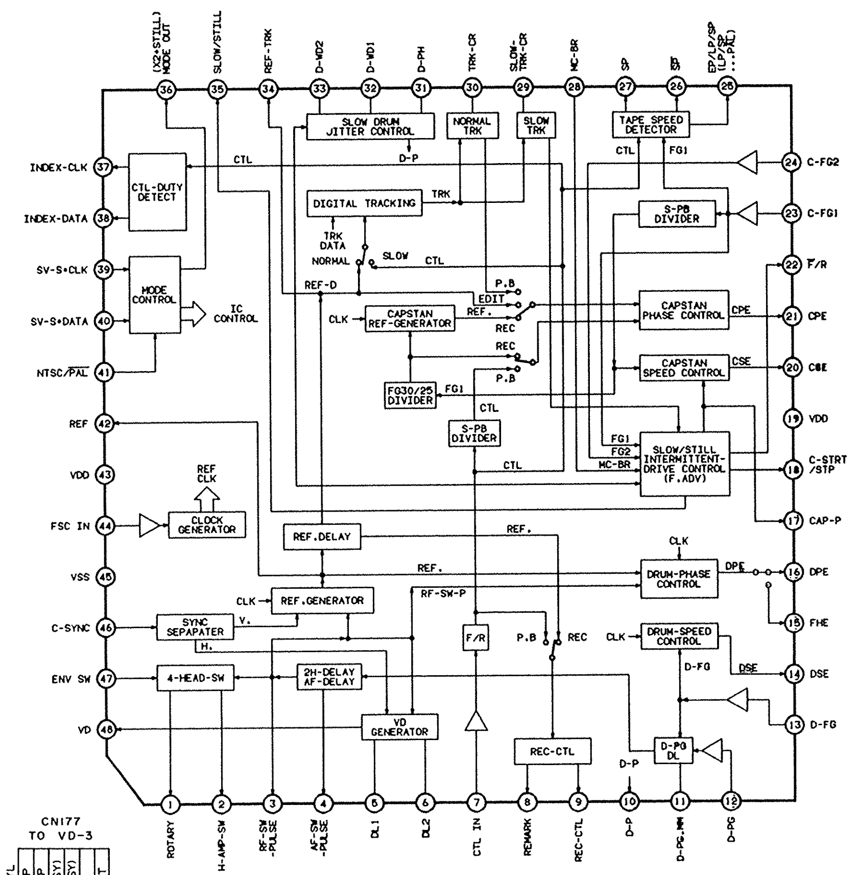
TB-1 TERMINAL P.C.B.


CN851
CN852
CN853
CN854
CN855
CN856
JK851
JK852
VR851
VR852
SW851 OFF
TB-1
1AC4B10A20800B
LO.NO.8501

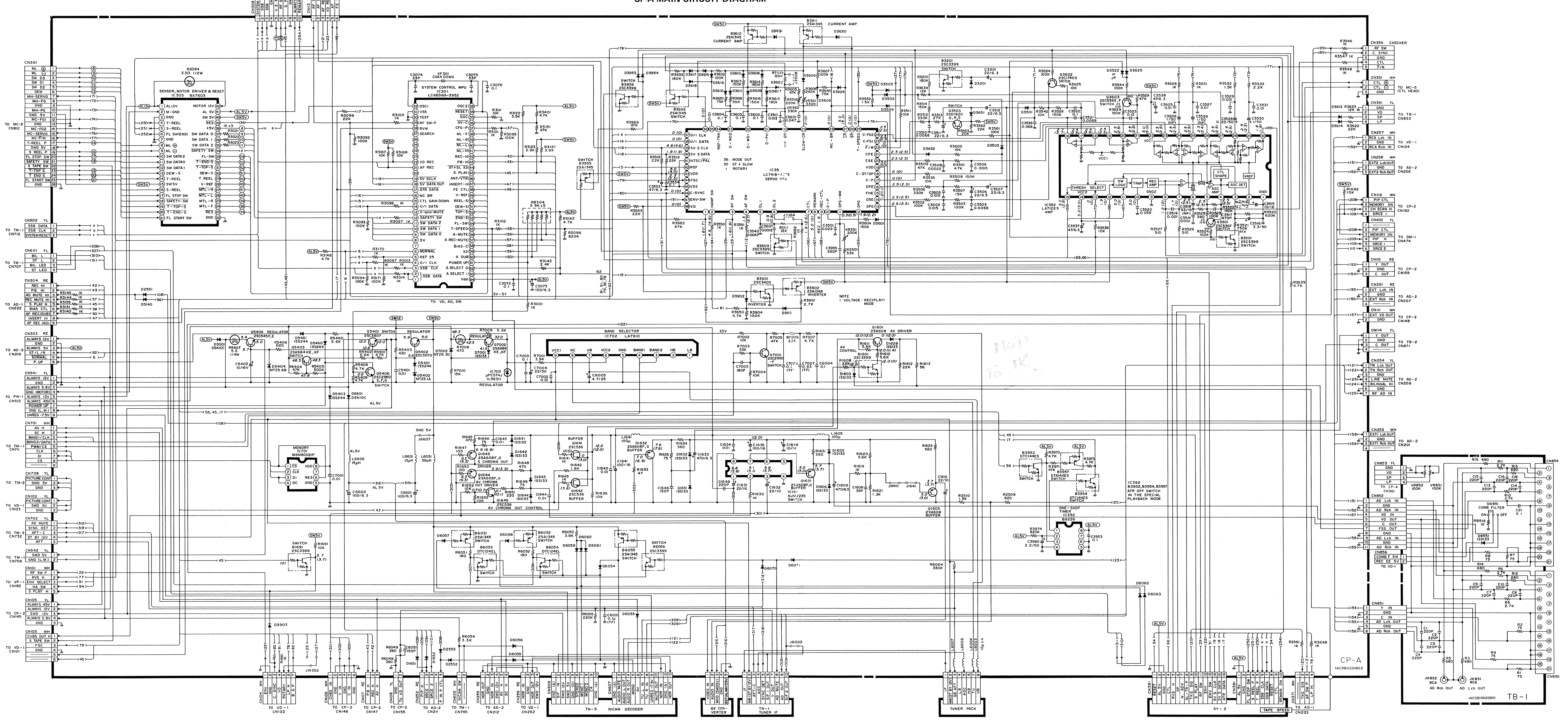
IC305 HIC CIRCUIT DIAGRAM


BX7603
IC1 LB1641
IC2 LA6393F
IC3 MN1280-S,R
ALL.LO.NO.3401-
D1...MTZ8.2B
D2...MTZJ6.4B
FL-SW(TOP) (IN)
T-END-S (IN)
T-TOP-S (IN)
SAFETY-SW (IN)
FL-SW(END) (IN)
S-REEL (IN)
SW 5V (OUT)
ML (OUT)
DEW-S (IN)
SW DATA D1 (IN)
SW DATA D0 (IN)
SW DATA D2 (IN)
ML (IN)
GND (IN)
FL-SW(END) (OUT)
S-REEL (OUT)
T-REEL (IN)
GND (IN)
M-GND (IN)
ALWAYS 13V (IN)
GND (OUT)
RES (OUT)
MTL-FWD (OUT)
MTL-RVS (OUT)
MTL-H (OUT)
MTL-L (OUT)
V-REF (OUT)
T-REEL (OUT)
DEW-S (OUT)
T-TOP-S (OUT)
T-END-S (OUT)
FL SW (OUT)
SAFETY-SW (OUT)
SW DATA D2 (OUT)
SW DATA D1 (OUT)
SW DATA D0 (OUT)
+5V (OUT)
RES (OUT)
SW 5V (IN)
ALWAYS 5V (IN)
MOTOR 13V (IN)

IC351 (LC7418) DIGITAL SERVO IC. INTER BLOCK DIAGRAM


INDEX-CLK
INDEX-DATA
5V-S-CLK
5V-S-DATA
NTSC/PAL
REF
VDD
FSC IN
C-SYNC
ENV SW
VS
CTL OUTPUT DETECT
MODE CONTROL
SLOW DRUM JITTER CONTROL
NORMAL CTL
SLOW CTL
TAPE SPEED DETECTOR
DIGITAL TRACKING
CAPSTAN REF-GENERATOR
CAPSTAN PHASE CONTROL
CAPSTAN SPEED CONTROL
S-PB DIVIDER
FS30/25 DIVIDER
S-PB DIVIDER
SLOW/STILL INTERMITTENT DRIVE CONTROL
CLOCK GENERATOR
REF.DELAY
REF.GENERATOR
DRUM-PHASE CONTROL
DRUM-SPEED CONTROL
SYNC SEPARATER
4-HEAD-SW
2H-DELAY AF-DELAY
VD GENERATOR
REC-CTL
D-FG
C-FG2
C-FG1
CPE
CSE
VDD
C-ST/SP
CAP-P
DPE
FHE
DSE
D-PG

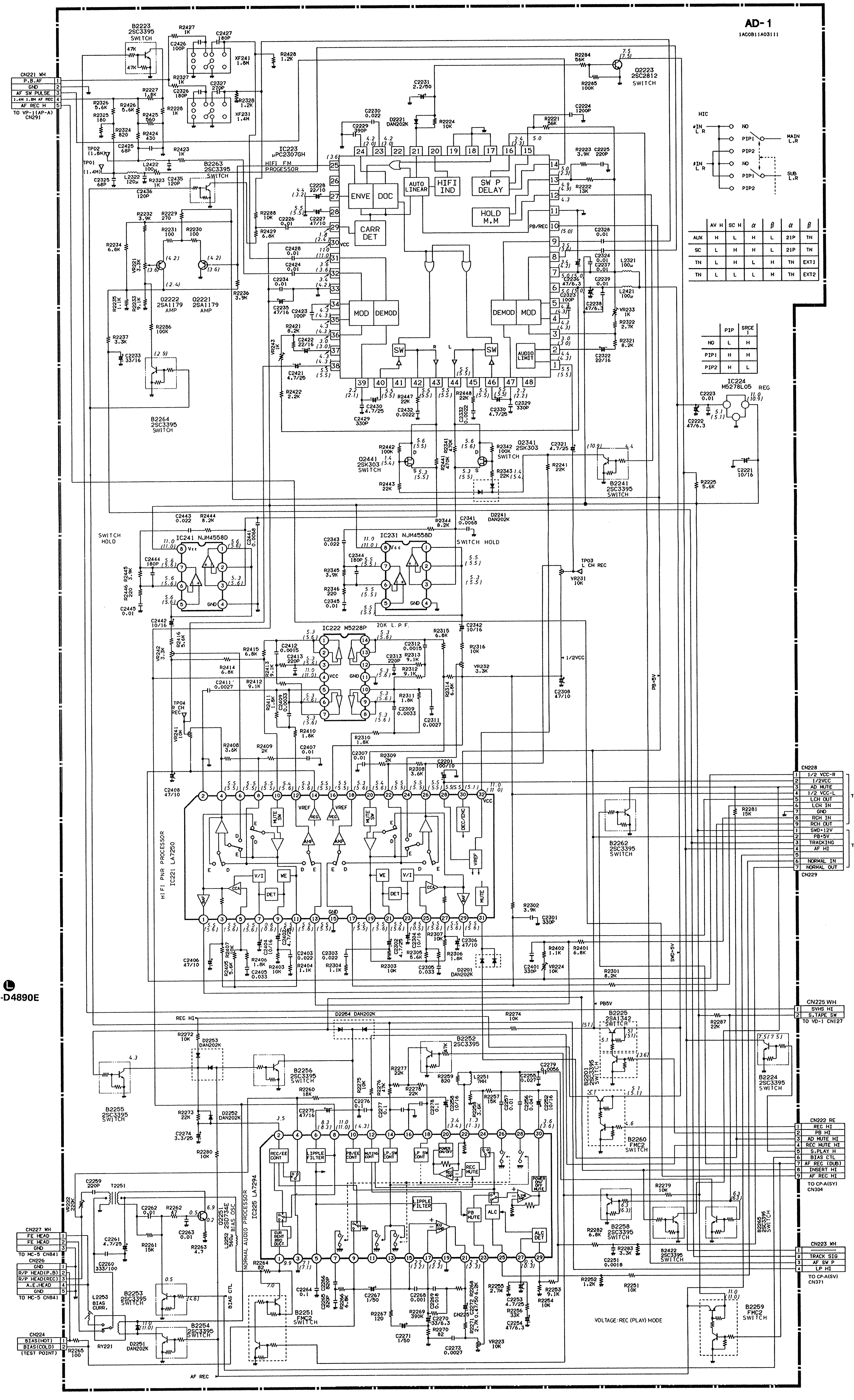
CP-A MAIN CIRCUIT DIAGRAM


CP-A
TB-I
CN301
CN302
CN501
CN304
CN303
CN541
CN701
CN708
CN102
CN702
CN542
CN101
CN105
CN103
CN359
CN351
CN361
CN257
CN258
CN112
CN402
CN115
CN251
CN111
CN114
CN254
CN253
CN852
CN853
CN851
CN854
CN855
CN752
CN177
IC301 SYSTEM CONTROL MPU LC6516A-3952
IC305 BX7603 SENSOR, MOTOR DRIVER & RESET
IC351 LC7418-1?9 SERVO
IC352 LA7122S AMP
IC702 LA7910 BAND SELECTOR
IC703 μPC574J REGULATOR
IC701 MEMORY M58M002P
IC392 BA226 ONE-SHOT TIMER
IC101 NJV2235 SWITCH
TN-5
NICAM DECODER
RF CONVERTER
TN-1 TUNER IF
TUNER PACK
SY-2
TAPE SPEED
NOTE: 1 VOLTAGE: REC(PLAY) MODE
IC392 B3952,B3954,B3957 ATR OFF SWITCH IN THE SPECIAL PLAYBACK MODE
TO MC-2 CN812
TO TM-1 CN712
TO TM-1 CN707
TO AD-1 CN222
TO AD-2 CN210
TO PW-1 CN512
TO TM-1 CN711
TO TM-1
TO VD-1 CN123
TO TM-1 CN732
TO TM-1 CN706
TO VP-1 CN182
TO CP-1 CN145
TO VD-1 CN121
TO DM-4
TO VD-3
TO MC-5 (CTL HEAD)
TO TB-1 CN853
TO VD-1 CN124
TO AD-2 CN202
TO CP-2 CN192
TO DM-1 CN474
TO CP-2 CN159
TO AD-2 CN207
TO CP-2 CN148
TO TB-2 CN871
TO AD-2 CN209
TO AD-2 CN201
TO CP-A CN361
TO VD-1
TO VD-1 CN122
TO CP-2 CN146
TO CP-2 CN147
TO CP-1 CN155
TO AD-2 CN211
TO TM-1 CN745
TO AD-2 CN212
TO VD-1 CN262
TO AD-1 CN223
TO VD, AD, DM
JK852 RCA AD Rch OUT
JK851 RCA AD Lch OUT
SW851 COMB FILTER
IAC9B1C01602
IAC0B1OA20801

MOD To 1K.

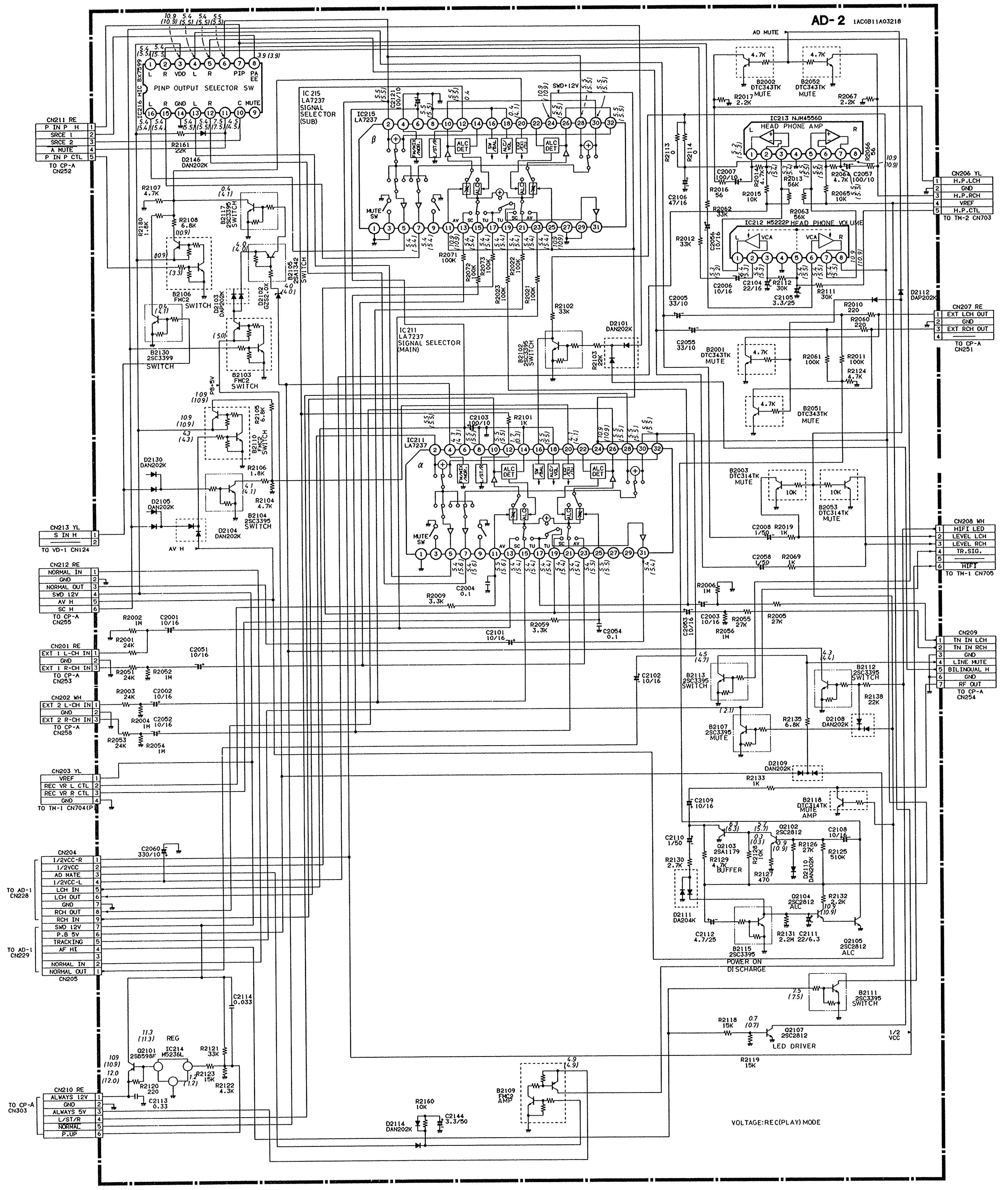
K VHR-D4890E

COMPL. AD-1 AUDIO Hi-Fi DEMODULATOR/NORMAL AUDIO CIRCUIT

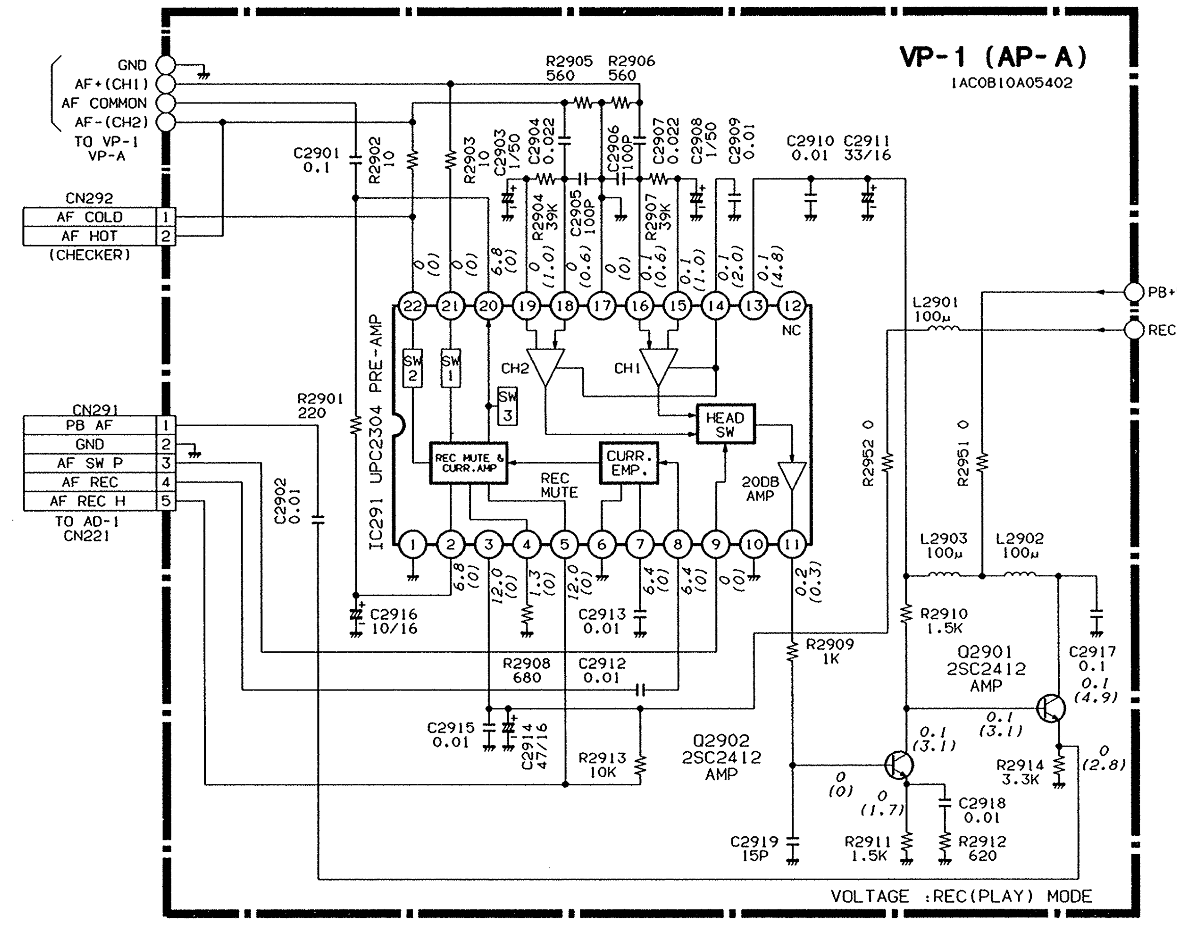

AD-1
1AC0B11A03111
IC223 μPC2307GH HIFI FM PROCESSOR
ENVE
DOC
AUTO LINEAR
HIFI IND
SW P DELAY
HOLD M.M
CARR DET
MOD
DEMOD
IC224 M5278L05 REG
IC241 NJM4558D
IC231 NJM4558D
IC222 M5228P 20K L.P.F.
IC221 LA7295 HIFI PAR PROCESSOR
IC225 LA7294 NORMAL AUDIO PROCESSOR
CN221
CN228
CN229
CN225
CN222
CN227
CN223
CN224
VOLTAGE REC (PLAY) MODE

VHR-D4890E

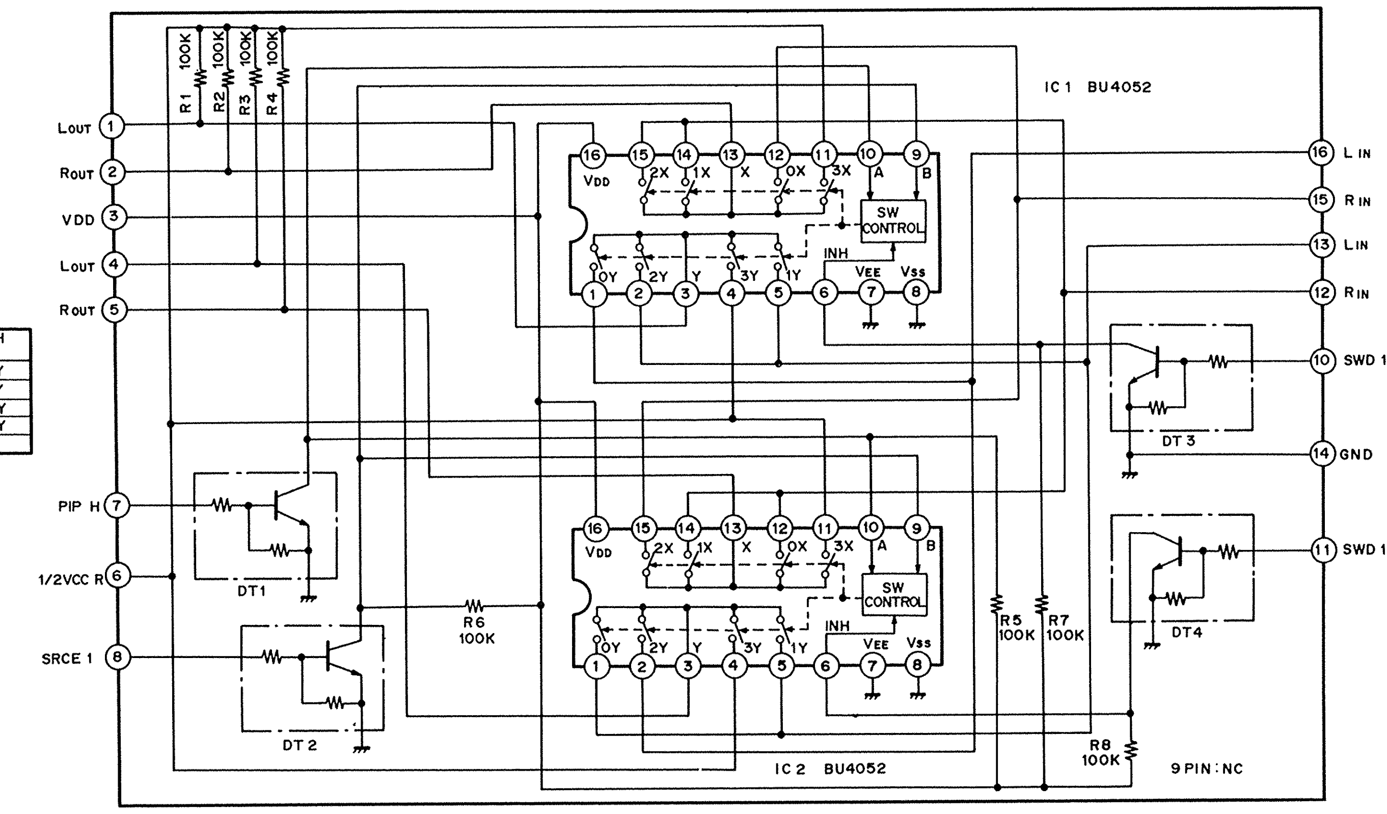
COMPL. AD-2 AUDIO INPUT/OUTPUT SIGNAL SELECT CIRCUIT


AD-2
1AC0B11A03218
PINP OUTPUT SELECTOR SW
IC215 LA7237 SIGNAL SELECTOR SUB
IC213 NJM4560 HEAD PHONE AMP
IC212 M5222P HEAD PHONE VOL
IC211 LA7237 SIGNAL SELECTOR MAIN
IC214 M5236L REG
LED DRIVER
VOLTAGE:REC(PLAY)MODE

COMPL. VP-1 AUDIO PRE-AMP CIRCUIT


VP-1 (AP-A)
1AC0B10A05402
IC291 UPC2304 PRE-AMP
REC MUTE & CURR. AMP
CURR. EMP.
HEAD SW
Q2901 2SC2412 AMP
Q2902 2SC2412 AMP
TO VP1 VP-A
CN292
CN291
TO AD-1 CN221
VOLTAGE :REC(PLAY) MODE

IC216 (BX7599) CIRCUIT

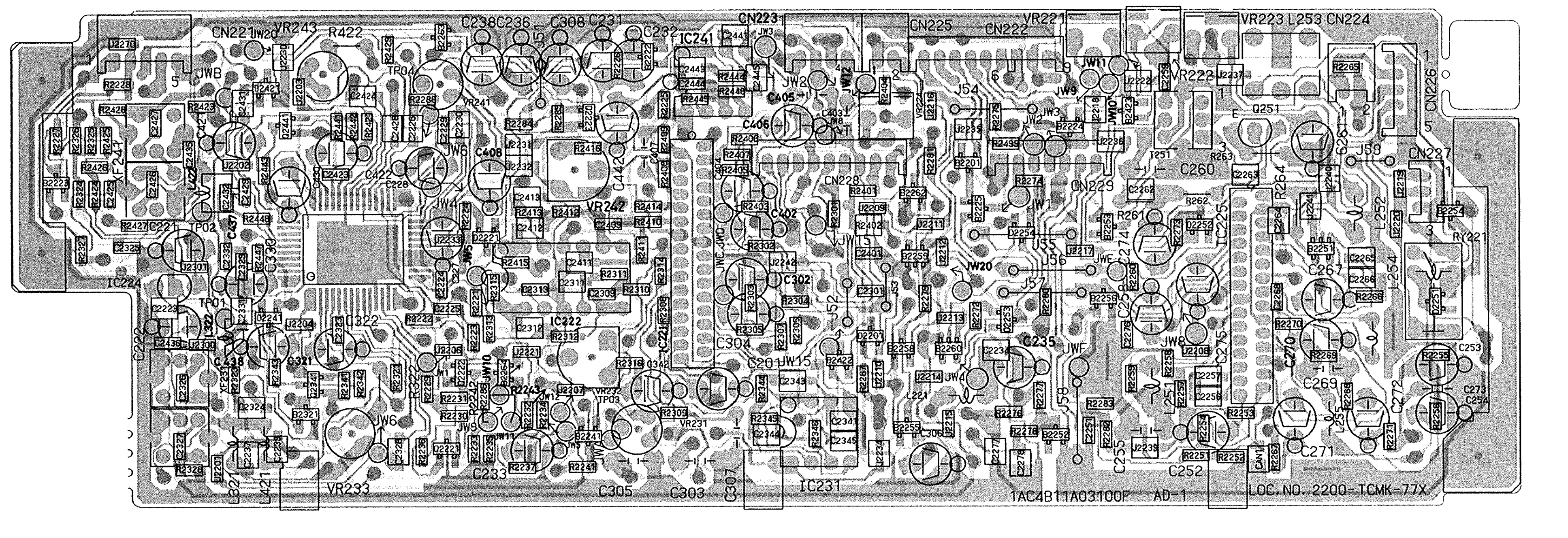

Lout
Rout
VDD
Lout
Rout
PIP H
1/2VCC R
SRCE 1
L IN
R IN
L IN
R IN
SWD 12V
GND
SWD 12V
IC1 BU4052
IC2 BU4052
DT1
DT2
DT3
DT4
R6 100K
R5 100K
R7 100K
R8 100K
9 PIN : NC

IC 1 & IC 2 SWITCH LOGIC

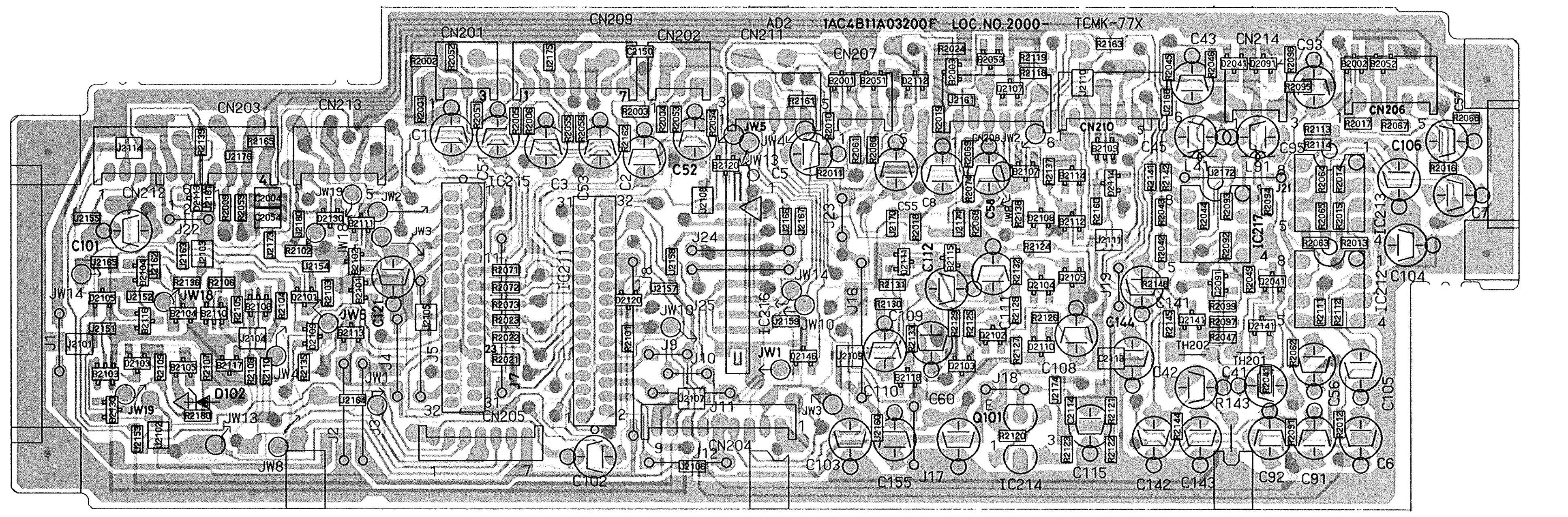
INH Pin6	A Pin10	B Pin 9	ON SWITCH X	ON SWITCH Y
L	L	L	0X	0Y
L	H	L	1X	1Y
L	L	H	2X	2Y
L	H	H	3X	3Y
H	※	※	OPEN	

※ Don't Care

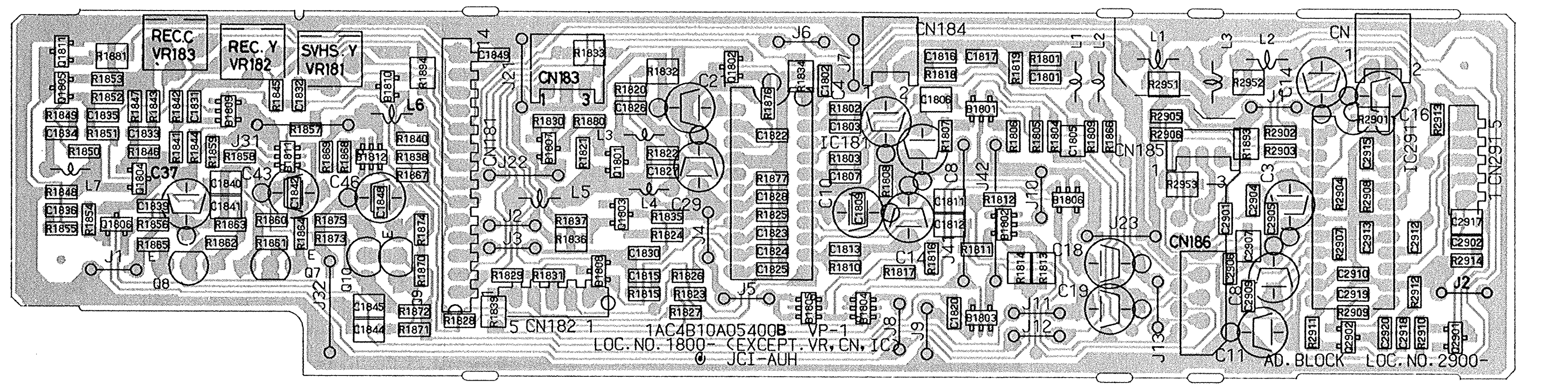
AD-1 AUDIO Hi-Fi DEMODULATOR/NORMAL AUDIO P.C.B.


1AC4B11A03100F AD-1
LOC. NO. 2200 TCMK-77X

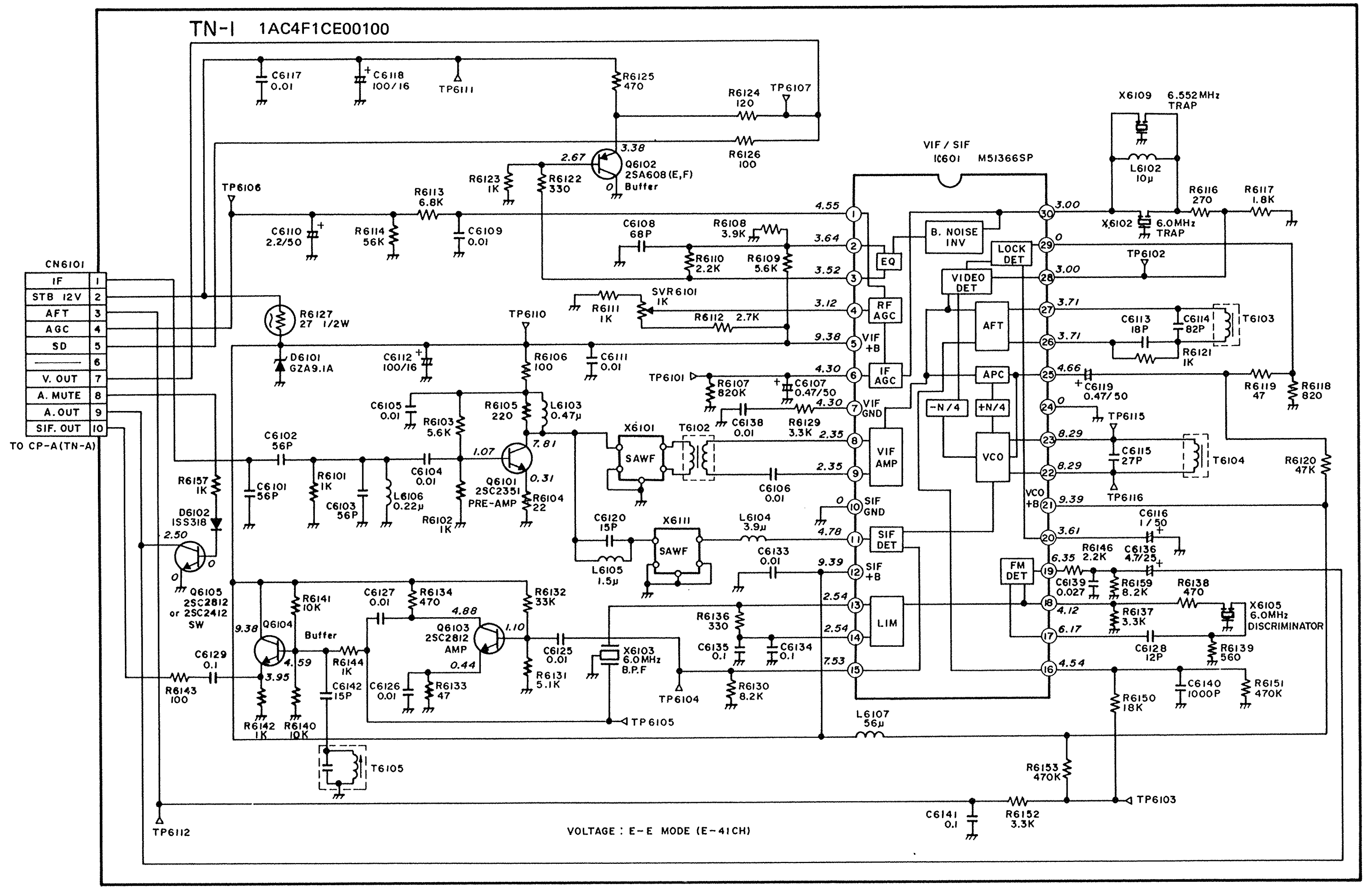
AD-2 AUDIO INPUT/OUTPUT SIGNAL SELECT P.C.B.


AD2 1AC4B11A03200F LOC.NO.2000 TCMK-77X

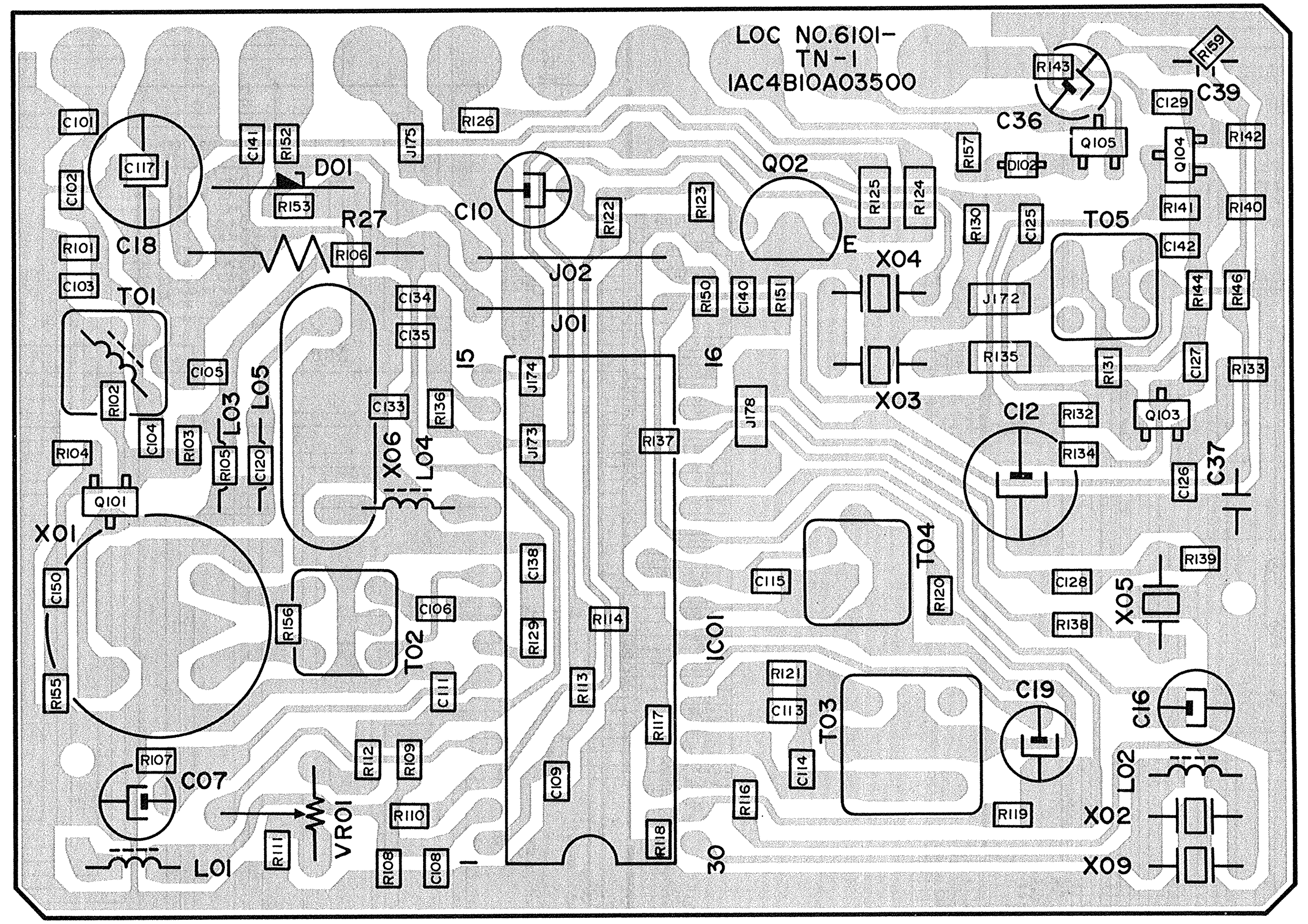
VP-1 VIDEO & AUDIO PRE-AMP P.C.B.


1AC4B10A05400B VP-1
LOC. NO. 1800 (EXCEPT. VR,CN)
JCT-AUM
AD.BLOCK LOC.NO.2500

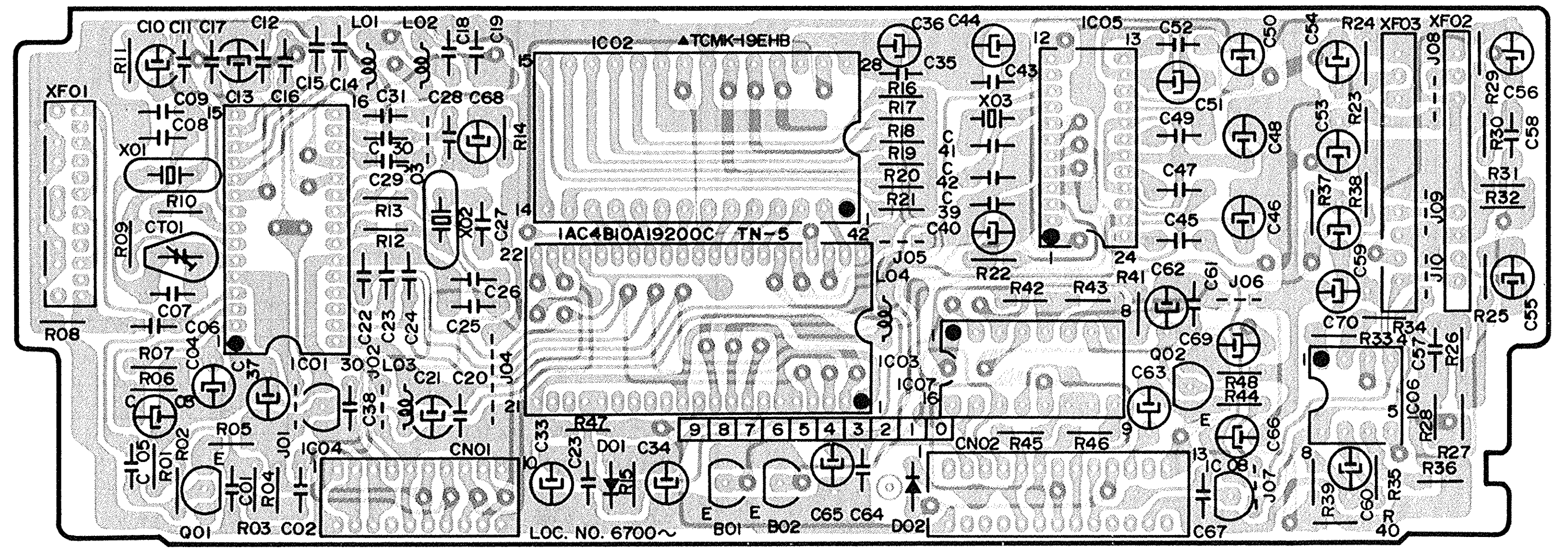
TUNER IF CIRCUIT DIAGRAM


TN-1 1AC4F1CE00100
CN6101
IF
STB 12V
AFT
AGC
SD
V. OUT
A. MUTE
SIF. OUT
TO CP-A(TN-A)
VIF / SIF IC6101 M51366SP
X6109 6.552MHz TRAP
X6102 6.0MHz TRAP
X6105 6.0MHz DISCRIMINATOR
Q6102 2SA608(E,F) Buffer
Q6103 2SC2351 PRE-AMP
Q6105 2SC2812 or 2SC2412 SW
Q6104 Buffer
Q6106 2SC2812 AMP
D6101 GZA9.1A
D6102 1SS318
SAWF
VOLTAGE : E-E MODE (E-41CH)

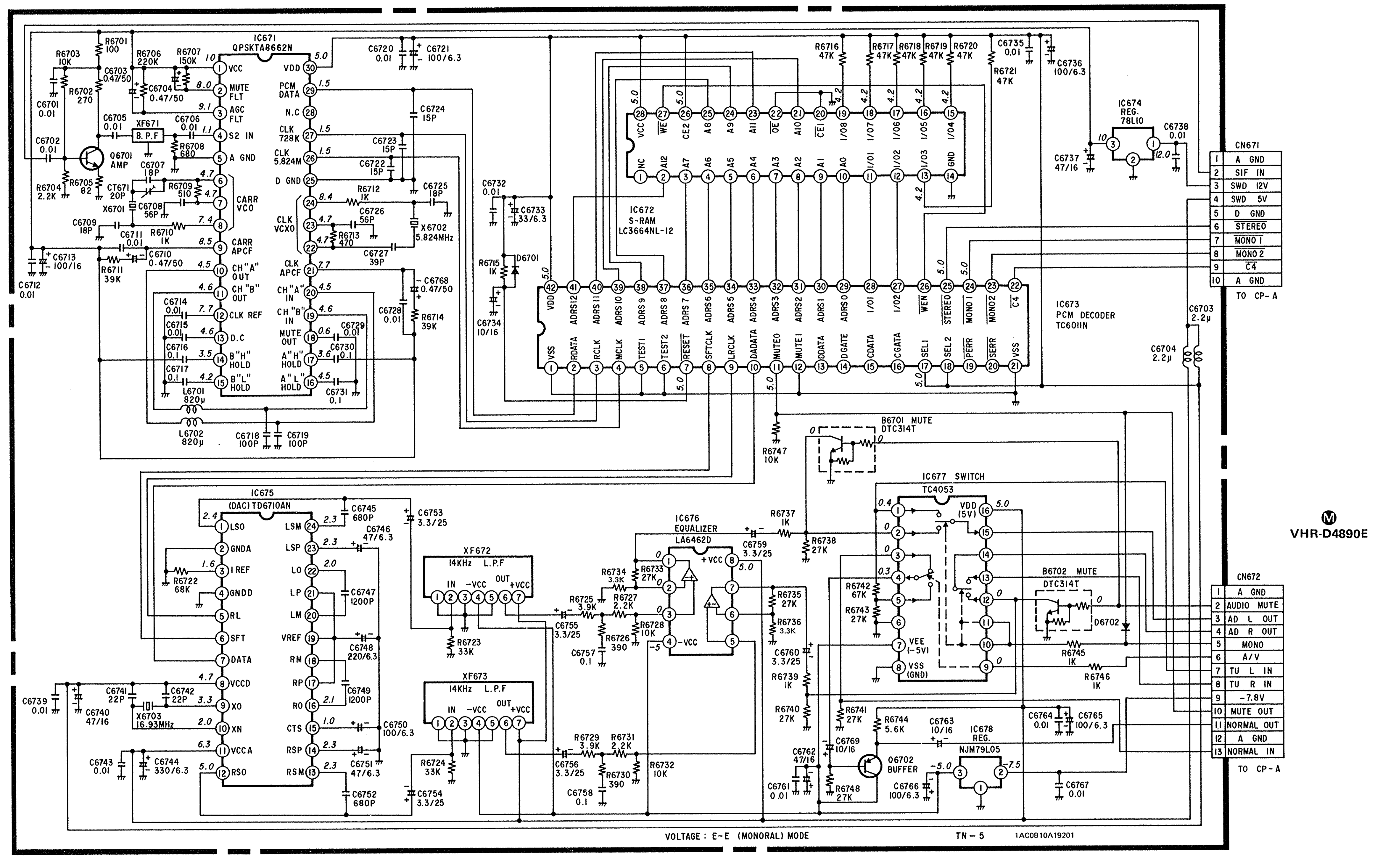
TUNER IF CIRCUIT BOARD


LOC NO.6101-
TN-1
1AC4B10A03500

NICAM DECODER CIRCUIT BOARD


TCMK19EHB
1AC4B10A19200C/TN-5
LOC. NO. 6700~

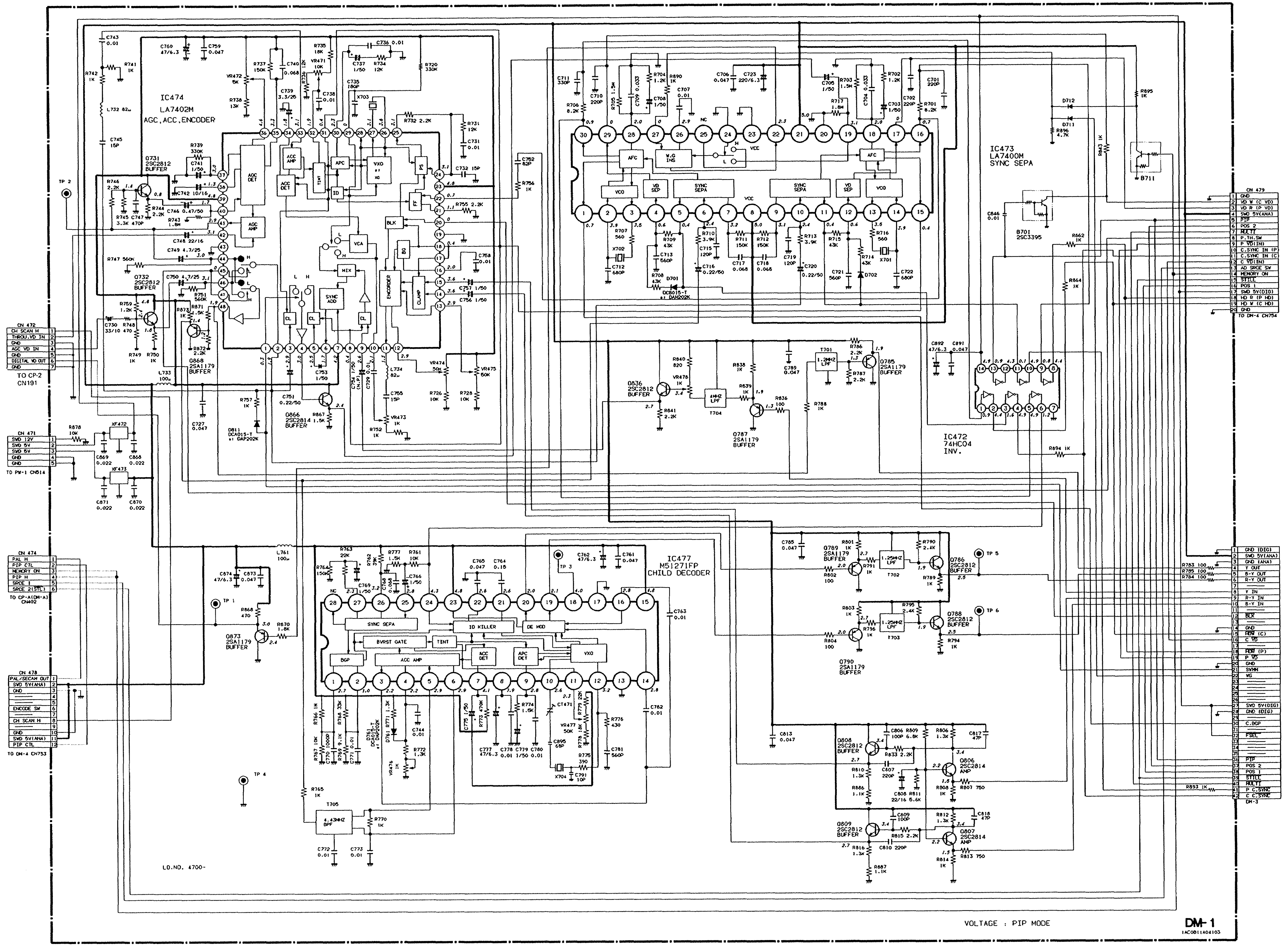
NICAM DECODER CIRCUIT DIAGRAM


IC671 QPSKTA8662N
IC672 S-RAM LC3664NL-12
IC673 PCM DECODER TC6011N
IC674 REG. 78L10
IC675 (DAC) TD6710AN
IC676 EQUALIZER LA6462D
IC677 SWITCH TC4053
IC678 REG. NJM79L05
XF672 14KHz L.P.F
XF673 14KHz L.P.F
Q6701 DTC314T MUTE
Q6702 BUFFER
Q6701 AMP
CN671
A GND
SIF IN
SWD 12V
SWD 5V
D GND
STEREO
MONO 1
MONO 2
C4
C4
TO CP-A
CN672
A GND
AUDIO MUTE
AD L OUT
AD R OUT
MONO
A/V
TU L IN
TU R IN
-7.8V
MUTE OUT
NORMAL OUT
A GND
NORMAL IN
TO CP-A
VOLTAGE : E-E (MONORAL) MODE
TN-5 1AC0B10A19201

Ⓜ VHR-D4890E

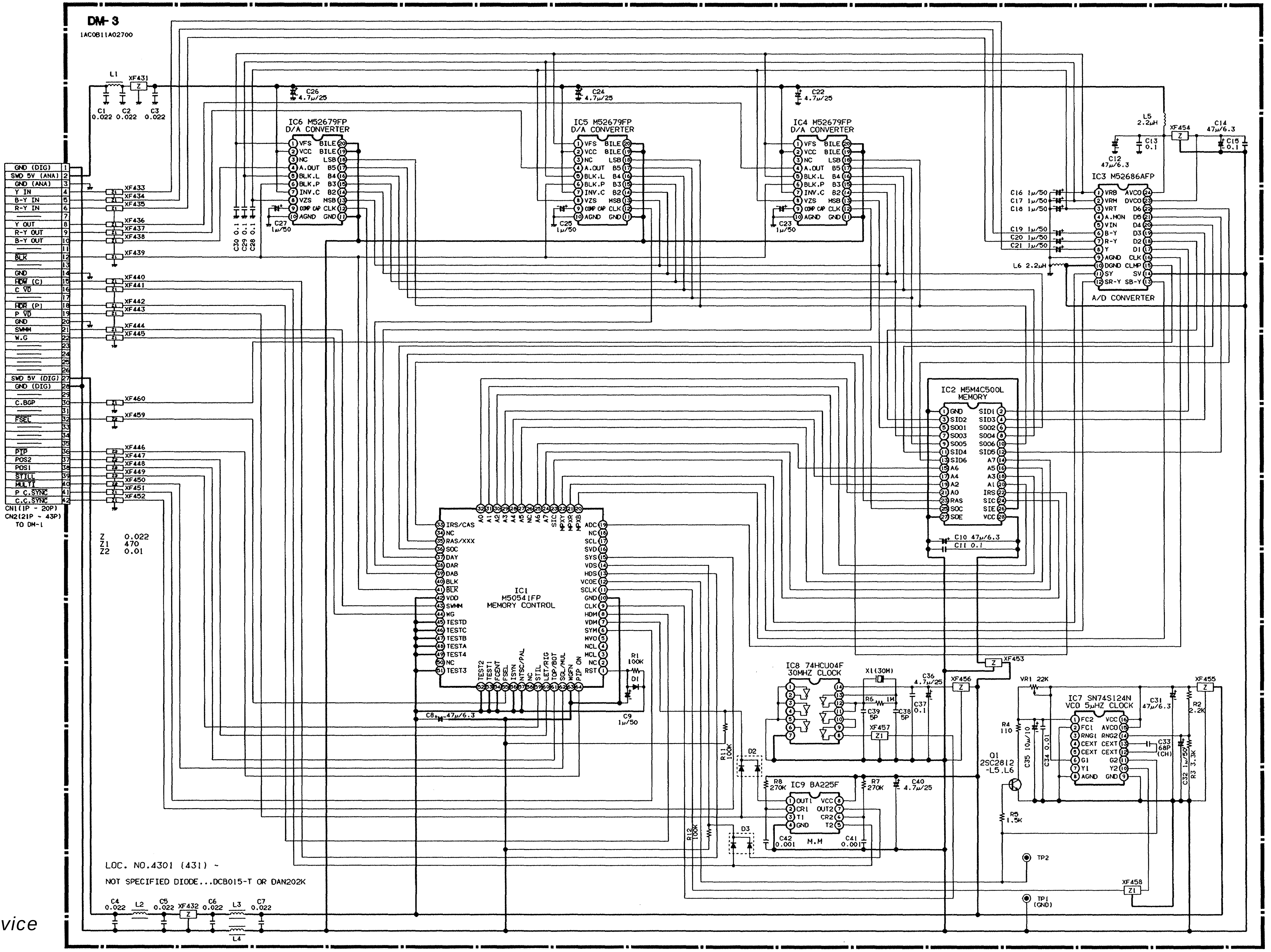
VHR-D4890E

COMPL. DM-1 ANALOG PROCESS FOR DIGITAL MEMORY CIRCUIT



IC474
LA7402M
AGC, ACC, ENCODER
IC473
LA7400M
SYNC SEPA
IC472
74HC04
INV.
IC477
M51271FP
CHILD DECODER
TO CP-2 CN101
TO DM-3 CN752
VOLTAGE : PIP MODE
DM-1

COMPL. DM-3 DIGITAL MEMORY CIRCUIT



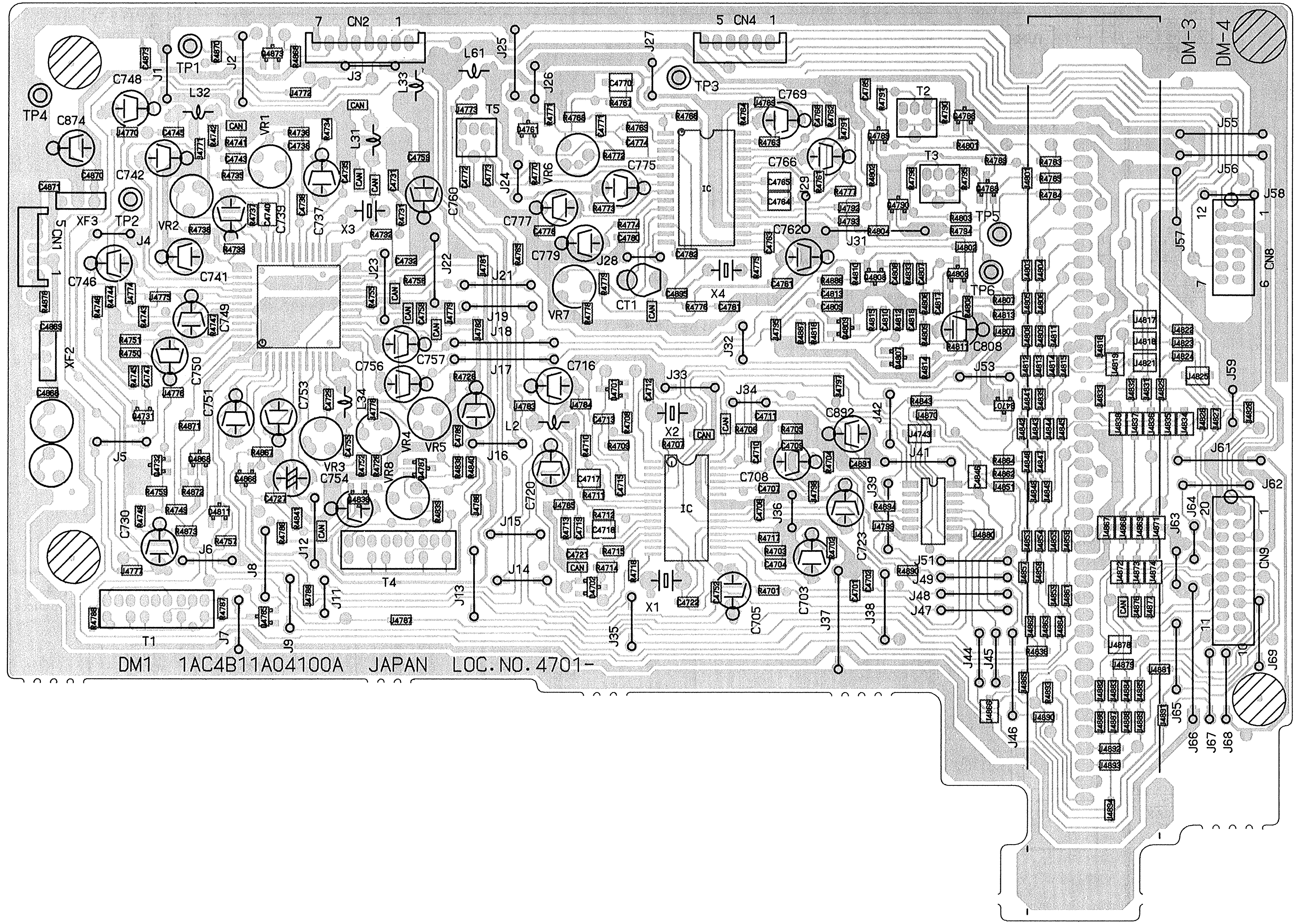
DM-3
IC6 M52679FP D/A CONVERTER
IC5 M52679FP D/A CONVERTER
IC4 M52679FP D/A CONVERTER
IC3 M52686AFP
A/D CONVERTER
IC2 M5M4C500L MEMORY
IC1 M50541FP MEMORY CONTROL
IC8 74HCU04F 30MHZ CLOCK
IC7 SN74S124N VCO 5μHZ CLOCK
IC9 BA225F
M.M
CN1(1P - 20P)
CN2(21P - 43P)
TO DM-1
Z 0.022
Z1 470
Z2 0.01
LOC. NO.4301 (431) ~
NOT SPECIFIED DIODE...DCB015-T OR DAN202K
TP1 (GND)
TP2

MC-Service

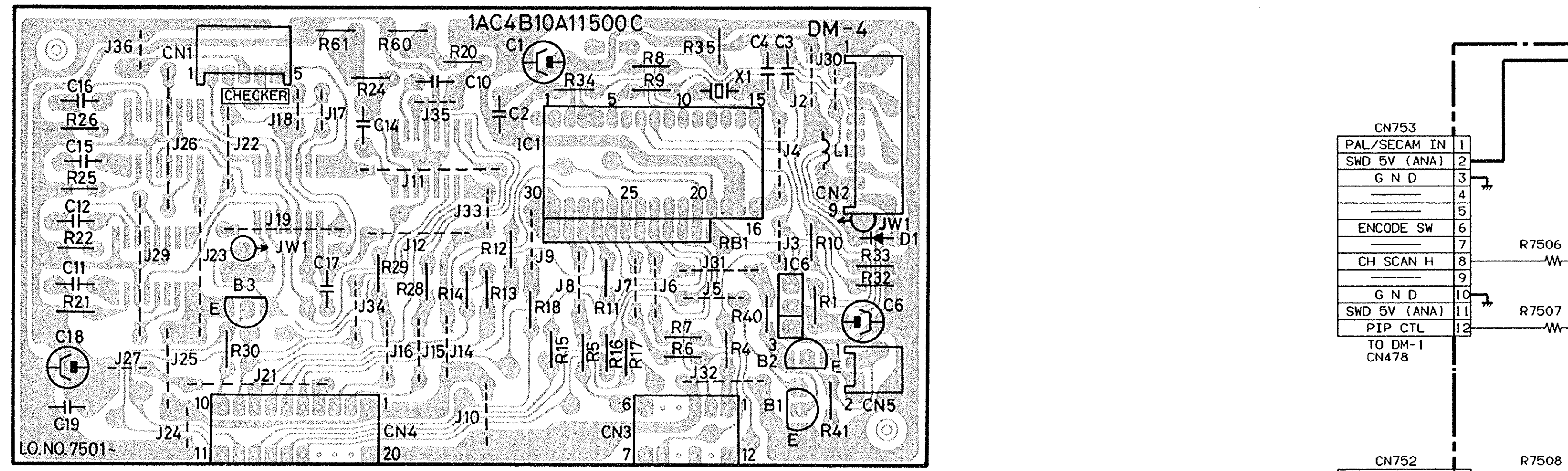
K
J
I
H
G
F
E
D
C
B
A

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

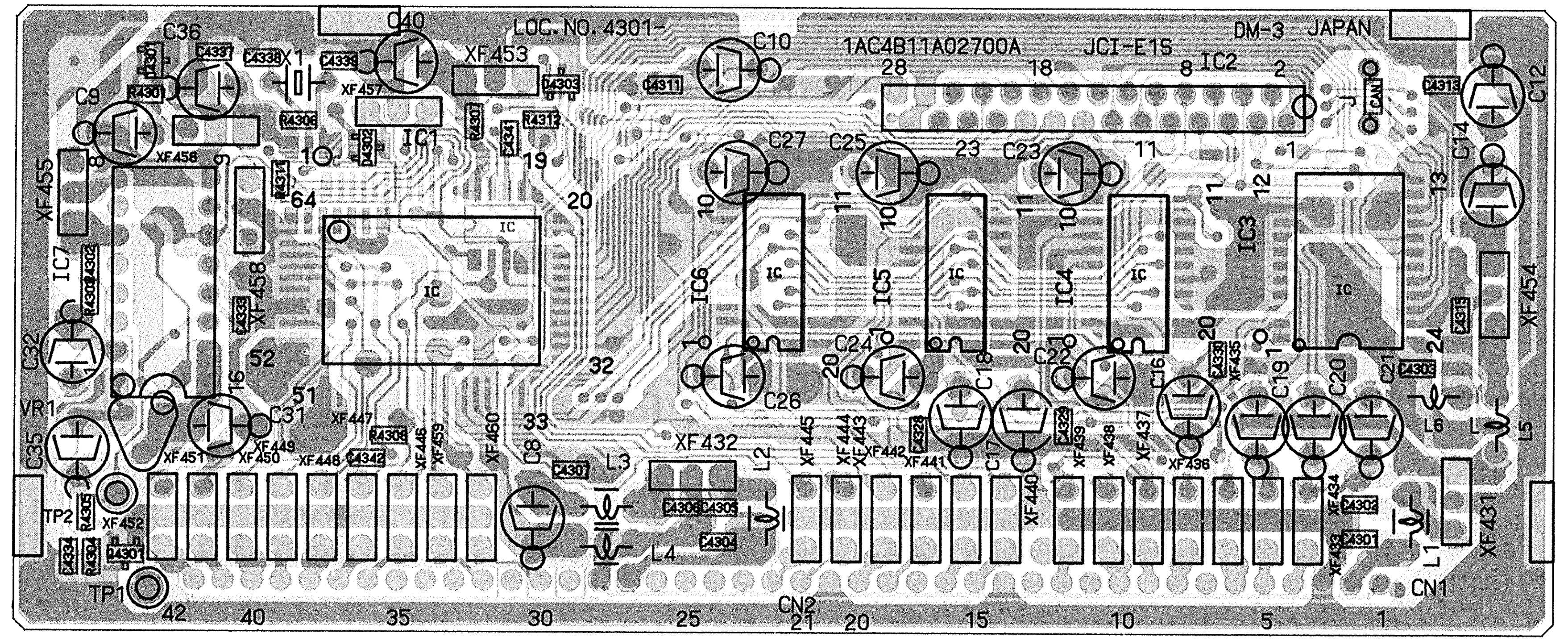
DM-1 ANALOG PROCESS FOR DIGITAL MEMORY P.C.B.


DM1 1AC4B11A04100A JAPAN LOC.NO.4701-
DM-3
DM-4
CN1
CN2
CN4
CN8
CN9
T1
T2
T3
T4
T5
TP1
TP2
TP3
TP4
TP5
TP6

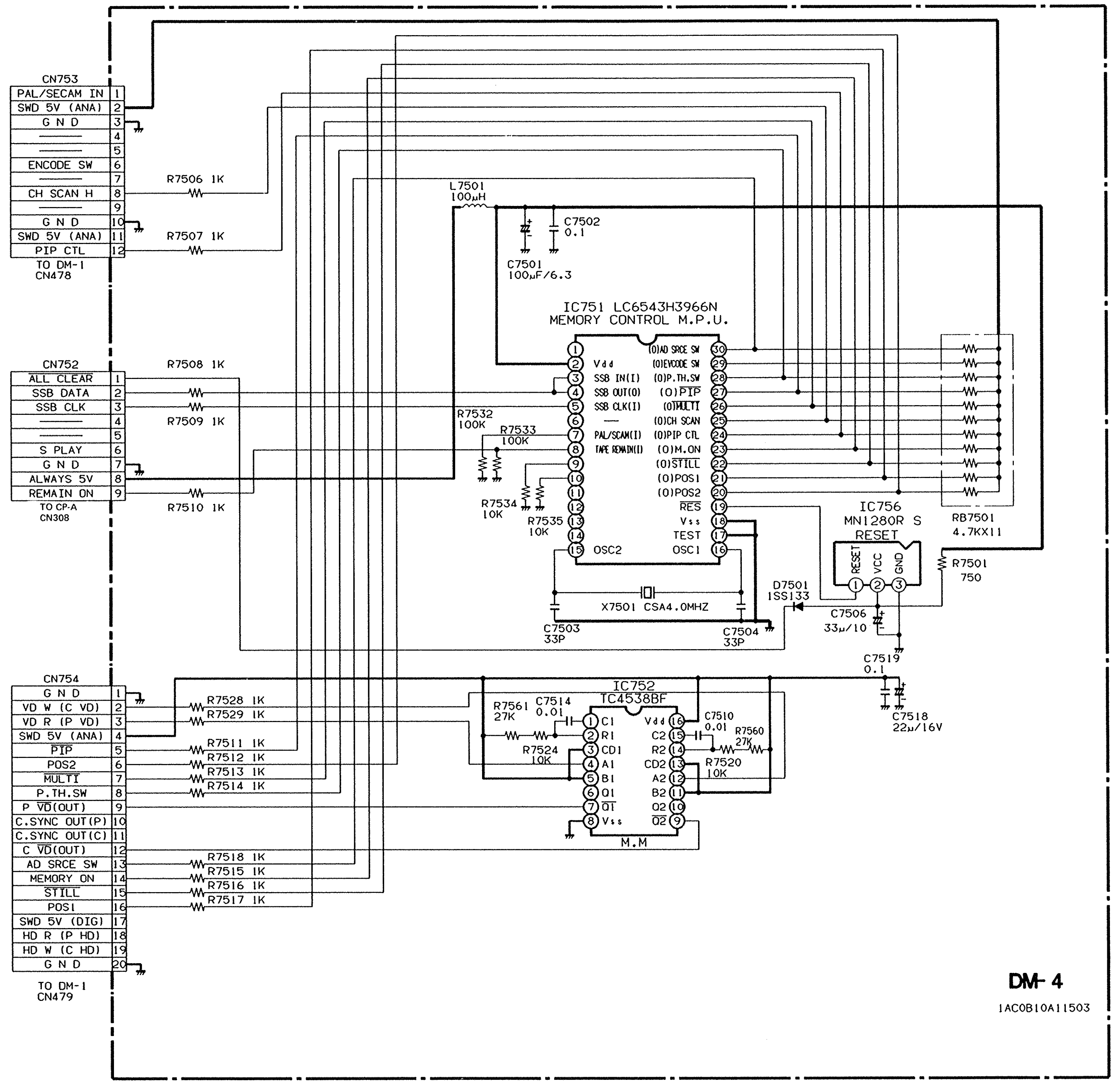
DM-4 DIGITAL MEMORY CONTROL P.C.B.


1AC4B10A11500C
DM-4
CHECKER
LO.NO.7501-
IC1
CN1
CN2
CN3
CN4
CN5
X1

DM-3 DIGITAL MEMORY P.C.B.


LOC.NO.4301-
1AC4B11A02700A
JCI-E1S
DM-3 JAPAN
IC2
IC3
IC4
IC5
IC6
IC7
CN1
CN2
TP1
TP2
VR1

COMPL. DM-4 DIGITAL MEMORY CONTROL CIRCUIT

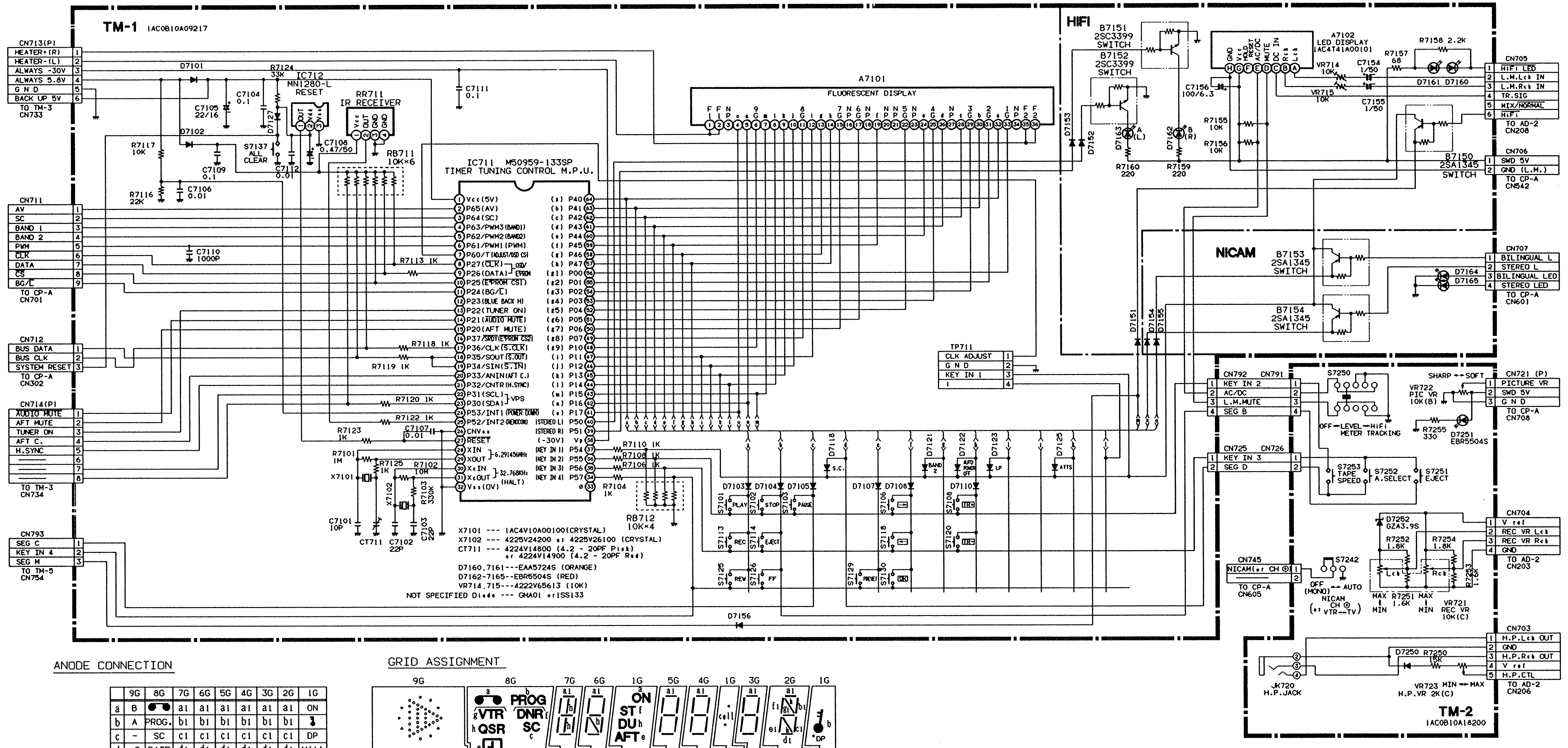

CN753
PAL/SECAM IN
SWD 5V (ANA)
G N D
ENCODE SW
CH SCAN H
G N D
SWD 5V (ANA)
PIP CTL
TO DM-1
CN478
R7506 1K
R7507 1K
L7501
100μH
C7502
0.1
C7501
100μF/6.3
IC751 LC6543H3966N
MEMORY CONTROL M.P.U.
Vdd
SSB IN(I)
SSB OUT(O)
SSB CLK(I)
PAL/SCAM(I)
TAPE REMAIN(I)
OSC2
(O)AD SRCE SW
(O)EVCODE SW
(O)P.TH.SW
(O)PIP
(O)MULTI
(O)CH SCAN
(O)PIP CTL
(O)M.ON
(O)STILL
(O)POS1
(O)POS2
RES
Vss
TEST
OSC1
CN752
ALL CLEAR
SSB DATA
SSB CLK
S PLAY
G N D
ALWAYS 5V
REMAIN ON
TO CP-A
CN308
R7508 1K
R7509 1K
R7510 1K
R7532
100K
R7533
100K
R7534
10K
R7535
10K
X7501 CSA4.0MHZ
C7503
33P
C7504
33P
IC756
MN1280R S
RESET
RESET
VCC
GND
RB7501
4.7KX11
R7501
750
D7501
1SS133
C7506
33μ/10
C7519
0.1
C7518
22μ/16V
CN754
G N D
VD W (C VD)
VD R (P VD)
SWD 5V (ANA)
PIP
POS2
MULTI
P.TH.SW
P VD(OUT)
C.SYNC OUT(P)
C.SYNC OUT(C)
C VD(OUT)
AD SRCE SW
MEMORY ON
STILL
POS1
SWD 5V (DIG)
HD R (P HD)
HD W (C HD)
G N D
TO DM-1
CN479
R7528 1K
R7529 1K
R7511 1K
R7512 1K
R7513 1K
R7514 1K
R7518 1K
R7515 1K
R7516 1K
R7517 1K
IC752
TC4538BF
R7561
27K
C7514
0.01
R7524
10K
C7510
0.01
R7560
27K
R7520
10K
C1
R1
CD1
A1
B1
Q1
Q1
Vss
Vdd
C2
R2
CD2
A2
B2
Q2
Q2
M.M
DM- 4
1AC0B10A11503

VHR-D4890E

K J I H G F E D C B A

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

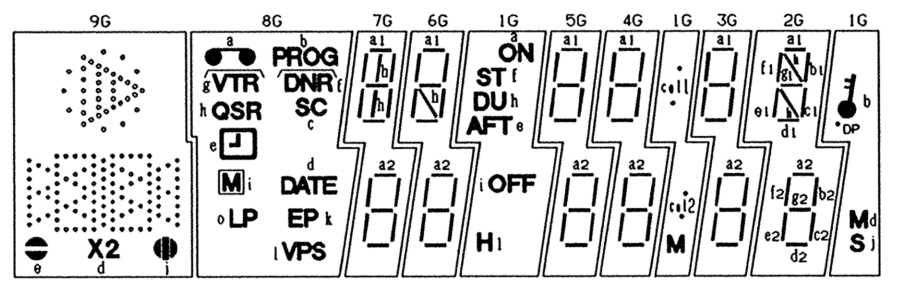
VHR-D4890E


TM-1
1AC0B10A09217
HIFI
NICAM
TM-2
1AC0B10A18200
IC711 M50959-133SP
TIMER TUNING CONTROL M.P.U.
IC712 MN1280-L RESET
RR711 IR RECEIVER
A7101 FLUORESCENT DISPLAY
A7102 LED DISPLAY
B7151 2SC3399 SWITCH
B7152 2SC3399 SWITCH
B7153 2SA1345 SWITCH
B7154 2SA1345 SWITCH
B7150 2SA1345 SWITCH
CN713(P)
HEATER+(R)
HEATER-(L)
ALWAYS -30V
ALWAYS 5.8V
G N D
BACK UP 5V
TO TM-3 CN733
CN711
AV
SC
BAND 1
BAND 2
PWM
CLK
DATA
CS
BG/C
TO CP-A CN701
CN712
BUS DATA
BUS CLK
SYSTEM RESET
TO CP-A CN302
CN714(P)
AUDIO MUTE
AFT MUTE
TUNER ON
AFT C.
H.SYNC
TO TM-3 CN734
CN793
SEG C
KEY IN 4
SEG M
TO TM-5 CN754
CN705
HIFI LED
L.M.L+t IN
L.M.R+t IN
TR.SIG
MIX/NORMAL
HIFI
TO AD-2 CN208
CN706
SWD 5V
GND (L.M.)
TO CP-A CN542
CN707
BILINGUAL L
STEREO L
BILINGUAL LED
STEREO LED
TO CP-A CN601
CN721 (P)
PICTURE VR
SWD 5V
G N D
TO CP-A CN708
CN704
V ref
REC VR L+t
REC VR R+t
TO AD-2 CN203
CN703
H.P.L+t OUT
GND
H.P.R+t OUT
V ref
H.P.CTL
TO AD-2 CN206
CN745
NICAM(+) CH
TO CP-A CN605
J4720 H.P.JACK
VR723 MIN ↔ MAX H.P.VR 2K(C)
S7250 OFF—LEVEL—HI-FI METER TRACKING
S7253 TAPE SPEED
S7252 A.SELECT
S7251 EJECT
VR722 PIC VR 10K(B)
SHARP ↔ SOFT
S7242 OFF (MONO) ↔ AUTO NICAM CH (+) VTR+TV
VR721 REC VR 10K(C)
TP711
CLK ADJUST
G N D
KEY IN 1
X7101 --- 1AC4V10A00100(CRYSTAL)
X7102 --- 4225V24200 or 4225V26100 (CRYSTAL)
--- 4224V14800 (4.2 - 20PF P+t)
--- 4224V14900 (4.2 - 20PF R+d)
D7160,7161---EAX5724S (ORANGE)
D7162-7165---EBR5504S (RED)
VR714,715---4222V65613 (10K)
NOT SPECIFIED Di+d+ --- GMA01 or 1SS133

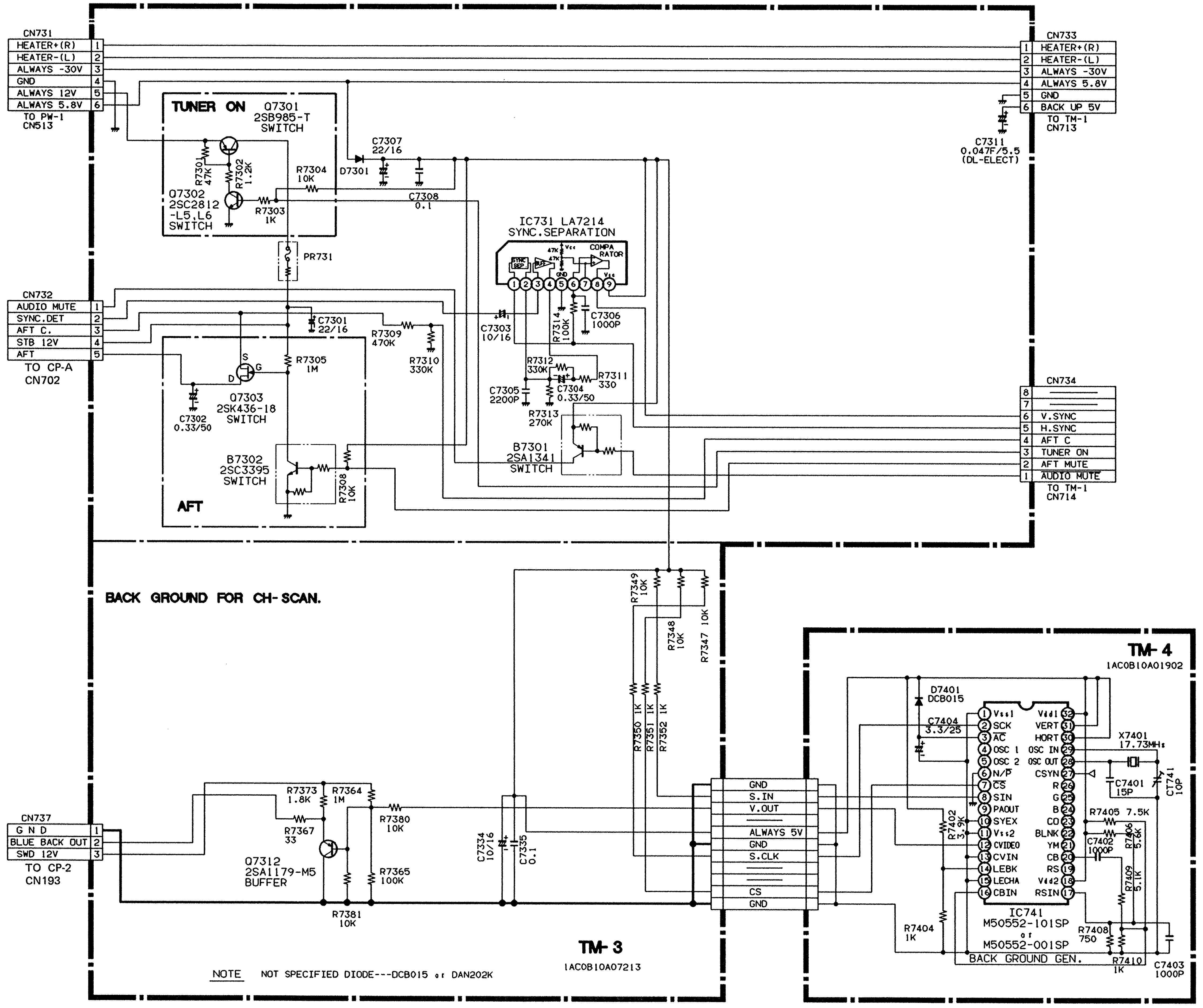
ANODE CONNECTION

	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	B	●‿●	a1	a1	a1	a1	a1	a1	ON
b	A	PROG.	b1	b1	b1	b1	b1	b1	●
c	–	SC	c1	c1	c1	c1	c1	c1	DP
d	×2	DATE	d1	d1	d1	d1	d1	d1	M(1)
e	⊖	▣	e1	e1	e1	e1	e1	e1	AFT
f	C	DNR	f1	f1	f1	f1	f1	f1	ST
g	D	VTR	g1	g1	g1	g1	g1	g1	col*1
h	–	QSR	/	\	–	–	–	\	DU
i	●	[M]	a2	a2	a2	a2	a2	a2	OFF
j	E	–	b2	b2	b2	b2	b2	b2	S
k	I	EP	c2	c2	c2	c2	c2	c2	–
l	H	VPS	d2	d2	d2	d2	d2	d2	H
m	J	–	e2	e2	e2	e2	e2	e2	M(2)
n	F	–	f2	f2	f2	f2	f2	f2	–
o	G	LP	g2	g2	g2	g2	g2	g2	col*2

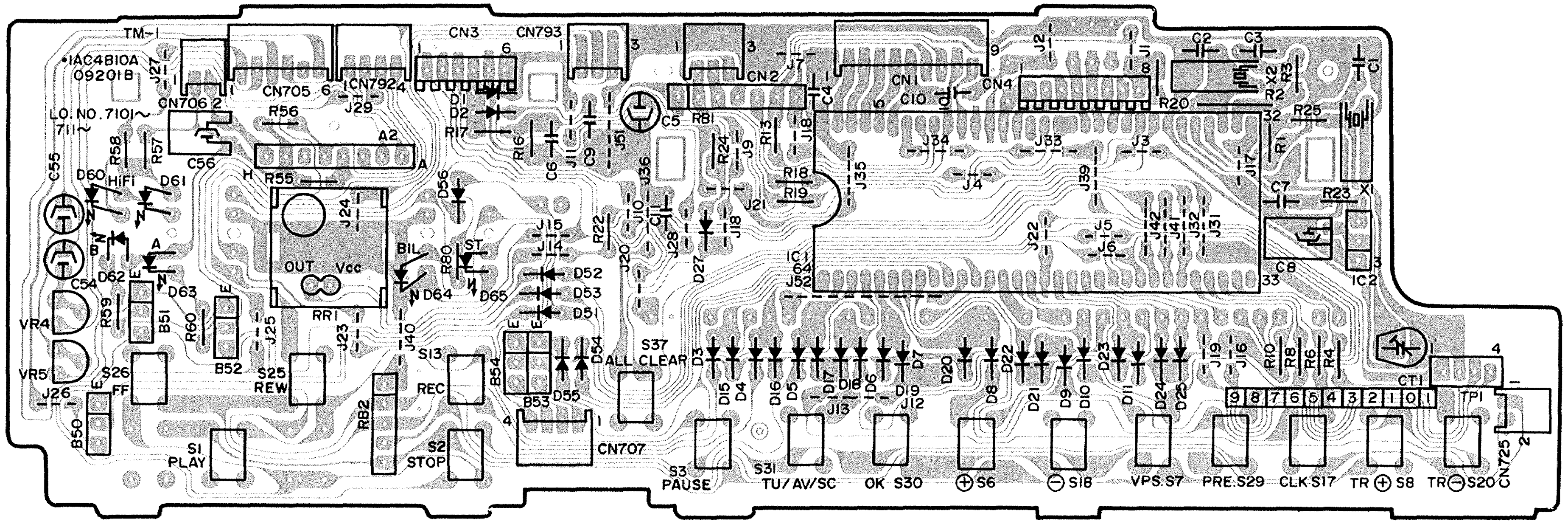
GRID ASSIGNMENT


9G
8G
7G
6G
1G
5G
4G
3G
2G
1G
VTR
QSR
PROG
DNR
SC
DATE
EP
LP
VPS
X2
ON
ST
DU
AFT
OFF
M
S

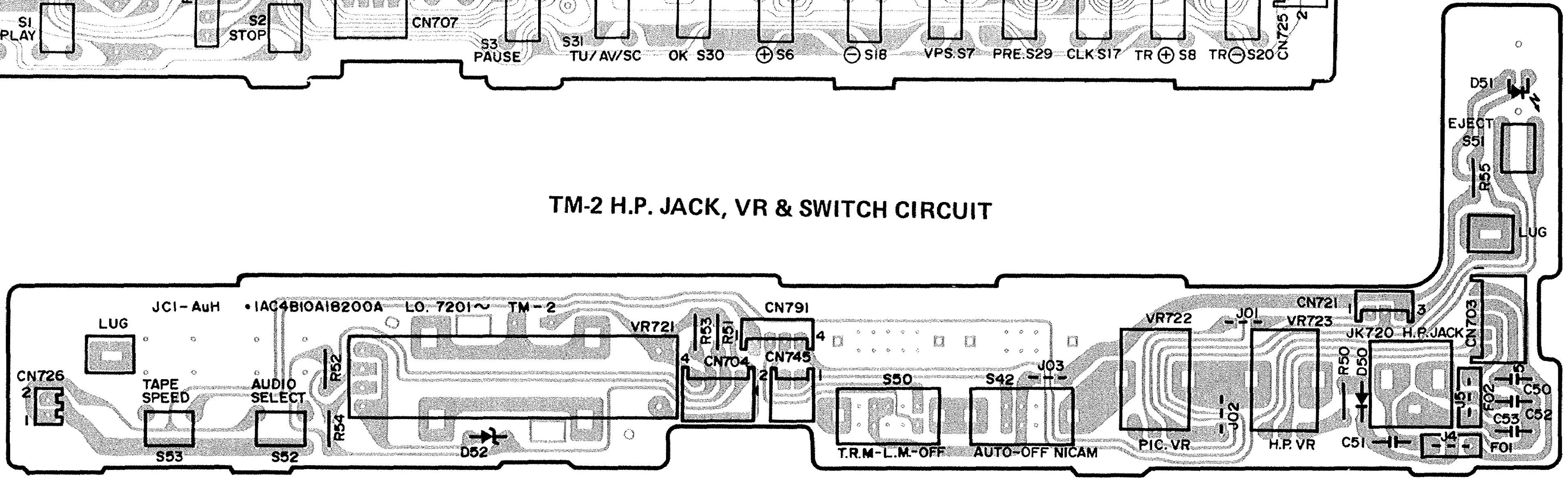
COMPL. TM-3,4 VPS, SYNC. SEPARATION & BACK GROUND FOR CHANNEL SCAN CIRCUIT DIAGRAM


CN731
HEATER+(R)
HEATER-(L)
ALWAYS -30V
GND
ALWAYS 12V
ALWAYS 5.8V
TO PW-1 CN513
CN733
HEATER+(R)
HEATER-(L)
ALWAYS -30V
ALWAYS 5.8V
GND
BACK UP 5V
TO TM-1 CN713
TUNER ON
Q7301 2SB985-T SWITCH
Q7302 2SC2812 -L5,L6 SWITCH
C7311 0.047F/5.5 (DL-ELECT)
IC731 LA7214 SYNC.SEPARATION
PR731
CN732
AUDIO MUTE
SYNC.DET
AFT C.
STB 12V
AFT
TO CP-A CN702
Q7303 2SK436-18 SWITCH
B7302 2SC3395 SWITCH
B7301 2SA1341 SWITCH
AFT
CN734
V.SYNC
H.SYNC
AFT C
TUNER ON
AFT MUTE
AUDIO MUTE
TO TM-1 CN714
BACK GROUND FOR CH-SCAN.
TM-4
1AC0B10A01902
D7401 DCB015
X7401 17.73MHz
IC741 M50552-101SP or M50552-001SP BACK GROUND GEN.
GND
S.IN
V.OUT
ALWAYS 5V
GND
S.CLK
CS
GND
CN737
G N D
BLUE BACK OUT
SWD 12V
TO CP-2 CN193
Q7312 2SA1179-M5 BUFFER
TM-3
1AC0B10A07213
NOTE NOT SPECIFIED DIODE---DCB015 or DAN202K

TM-1 TIMER, DISPLAY & TUNING CONTROL P.C.B.


TM-1
•1AC4B10A 09201B
LO. NO. 7101~ 711~
CN706
CN705
CN792
CN3
CN793
CN2
CN1
CN4
J27
J29
R56
R58
R57
C56
A2
R55
C55
D60
HiFi
D61
C54
D62
D63
VR4
VR5
R59
B51
R60
B52
J25
J23
J24
OUT
Vcc
RR1
J40
BIL
D64
R80
ST
D65
D56
D1
D2
R17
R16
C6
J11
C9
J51
J36
C5
RB1
R13
R24
J9
J18
C4
J7
J15
J14
D52
D53
D51
R22
J10
J20
J28
J8
D27
R18
R19
J21
IC1
64
J52
J35
J34
J33
J4
J39
J3
J5
J6
J22
J42
J41
J32
J31
J17
C10
C2
C3
X2
R2
R3
R20
R25
R1
C1
C7
R23
X1
IC2
C8
32
33
S26
FF
S25
REW
S13
REC
B54
D54
B53
D55
ALL
S37
CLEAR
D3
D15
D4
D16
D5
D17
D18
D6
D19
D7
J13
J12
D20
D8
D22
D21
D9
D10
D23
D11
D24
D25
J19
J16
R10
R8
R6
R4
CT1
TP1
9 8 7 6 5 4 3 2 1 0 1
J26
B50
R82
S1
PLAY
S2
STOP
CN707
S3
PAUSE
S31
TU/AV/SC
OK S30
⊕ S6
⊖ S18
VPS.S7
PRE.S29
CLK S17
TR ⊕ S8
TR ⊖ S20
CN725

TM-2 H.P. JACK, VR & SWITCH CIRCUIT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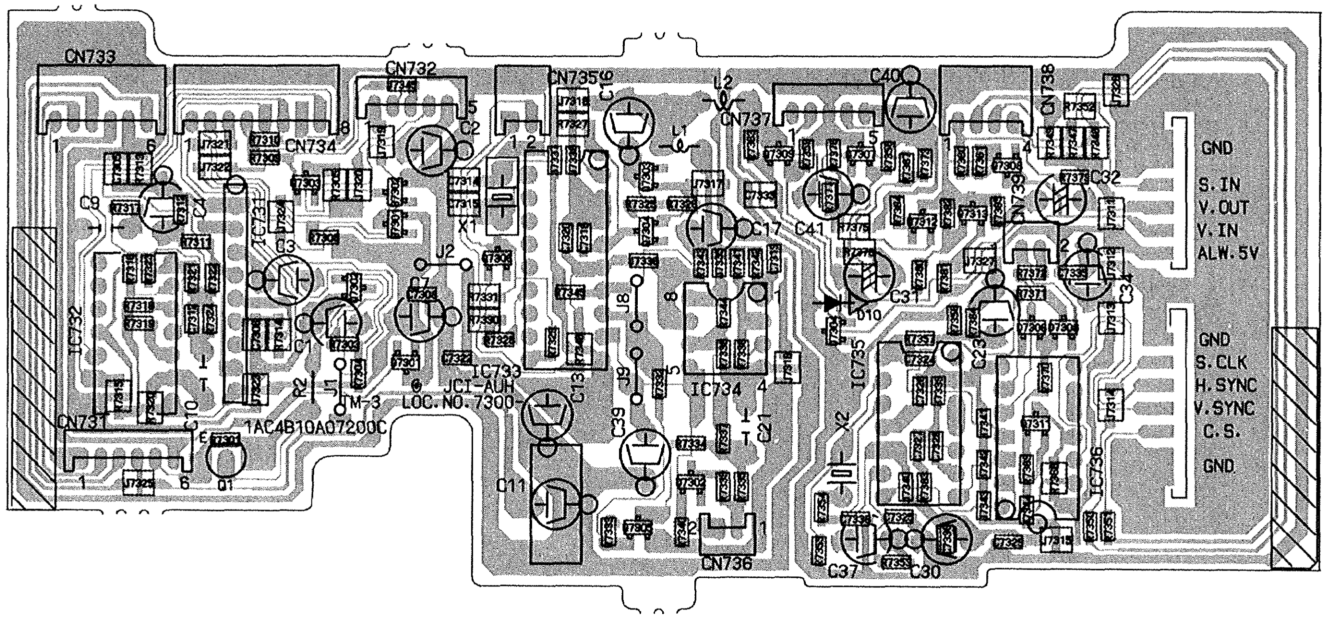
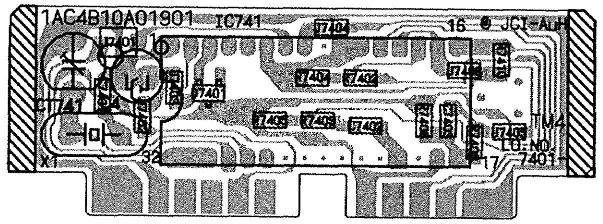
JC1-AuH
•1AC4B10A18200A
LO. 7201~
TM-2
VR721
R53
R51
CN791
CN704
CN745
CN726
TAPE SPEED
AUDIO SELECT
R52
R54
S53
S52
D52
S50
S42
J03
T.R.M-L.M-OFF
AUTO-OFF NICAM
VR722
J01
J02
PIC. VR
VR723
H.P. VR
CN721
JK720 H.P.JACK
CN703
R50
D50
C51
J5
J4
F02
F01
C50
C53
C52
D51
EJECT
S51
R55
LUG

TM-3 SYNC. SEPARATION & BACK GROUND FOR CHANNEL SCAN P.C.B.


CN733
CN732
CN734
CN735
C16
L2
CN737
C40
CN738
C2
X1
L1
C17
C41
C32
C9
C4
IC731
Q3
C1
D7
J2
J8
J9
C31
D10
C23
C34
IC732
IC733
IC734
IC735
IC736
C13
C39
C21
X2
CN731
C10
Q1
TM-3
1AC4B10A07200C
JC1-AUH
LOC. NO. 7300~
C11
CN736
C37
C30
GND
S. IN
V. OUT
V. IN
ALW. 5V
GND
S. CLK
H. SYNC
V. SYNC
C.S.
GND

TM-4 BACK GROUND GENERATOR P.C.B.

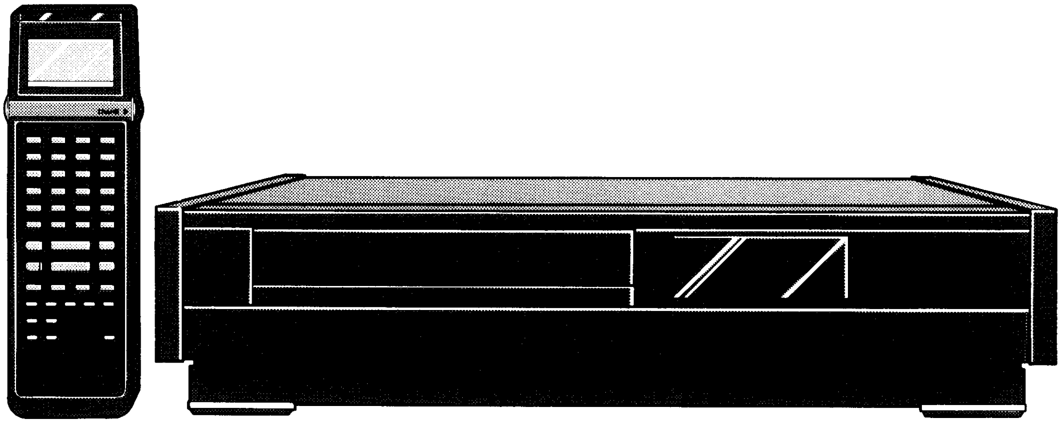

1AC4B10A01901
IC741
JC1-AuH
TM4
LO. NO. 7401~
X1
16
17
32

SANYO

Supplement Service Technical Information

Colour Video
Cassette Recorder

VHR-D4890 Series



Please add this supplement to the Service Technical Information (WM-22342) below.

S-VHS Video Circuit Description

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DP4PHSL Series

REFERENCE No. WM-530265

1. OUTLINE OF SVHS 625

As the current trend in colour televisions is to larger screens and higher picture quality, the need for home video units to connect to these televisions has become prominent.

When normal television broadcast programs are viewed on high picture quality colour televisions, a horizontal resolution of 400 lines can be obtained. This horizontal resolution becomes 250 lines when these video signals are recorded and played back on conventional home video units using the conventional VHS system. In other words, it is obvious that the resolution of the home video picture is less than the original broadcast program. This results in a loss of the expressiveness provided by the improved picture quality. The emergence of home video units with high picture quality has become an urgent matter, and this S-VHS home video system was developed to meet this need.

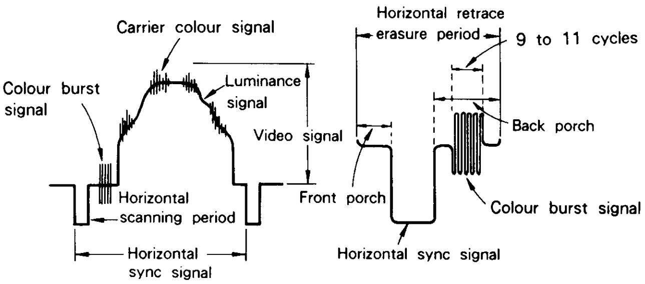

Carrier colour signal
Colour burst signal
Luminance signal
Video signal
Horizontal scanning period
Horizontal sync signal
Horizontal retrace erasure period
9 to 11 cycles
Back porch
Front porch
Colour burst signal
Horizontal sync signal

Fig. 1-1 PAL Video Signal

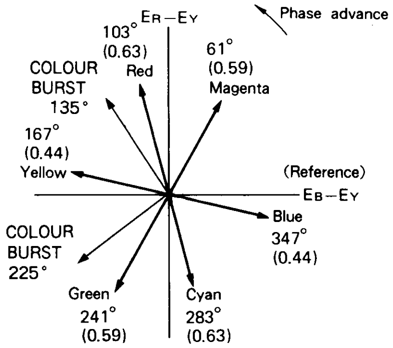

ER−EY
103°
(0.63)
Red
COLOUR BURST 135°
Phase advance
61°
(0.59)
Magenta
167°
(0.44)
Yellow
(Reference)
EB−EY
Blue
347°
(0.44)
COLOUR BURST 225°
Green
241°
(0.59)
Cyan
283°
(0.63)

Fig. 1-3 Colour Signal Vectors

1-1. VIDEO SIGNALS IN PAL SYSTEM

The composite video signals in the PAL system consist of a luminance signal (Y signal) for expressing brightness and darkness of the subject, a carrier colour signal (C signal) for expressing the colours, vertical and horizontal sync signals for synchronizing the transmission and reception sides, and a colour burst signal. (Fig. 1-1)

The frequency components of the luminance signals (including sync signals) have a band of 0 to 5 MHz due to the sensitivity of the human eye to changes in brightness. The horizontal resolution is determined by the frequency band of the luminance signal, and a horizontal resolution of approximately 400 lines can be obtained with the PAL system. (0 to 5 MHz) (Fig. 1-2 ⓐ)

For the colour signal, the colour subcarrier having a high frequency of 4.43 MHz is right-angle phase modulated by the U and V signals of colour signal components created from the three primary colours of red, blue, and green. The chroma of the colour can be expressed by the amplitude of the vector and the hue by its phase. (Fig. 1-3) (Fig. 1-2ⓑ)

The composite video signals for the PAL system form the U signal component and V signal component of the Y signal and C signal described above. Their spectrum is shown in Fig. 1-2 ⓒ.

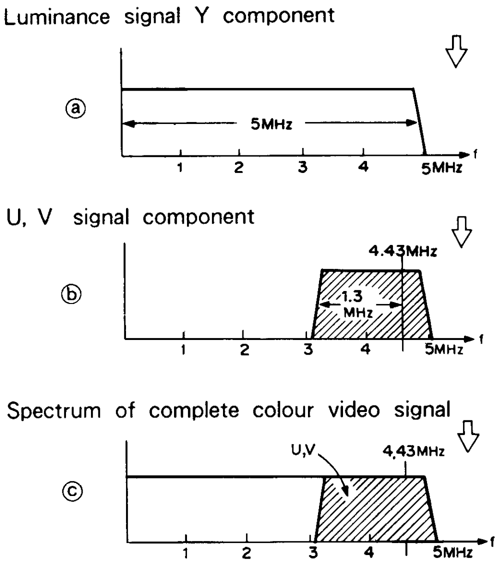


Fig. 1-2 Frequency Spectrum of PAL Video Signals

1-2. VHS VIDEO RECORDING AND PLAYBACK SYSTEM

VHS system video tape recorders separate the PAL system composite video signals described above into the luminance signal (Y signal) and colour signal (C signal), signal processes these separately, and records them onto magnetic tape.
During recording, the luminance signal is converted to an FM wave by an FM modulator having a 3.8 MHz sync tip carrier frequency, and this FM signal is recorded onto magnetic tape. During playback, the FM signal from the magnetic tape is demodulated to the original luminance signal by an FM demodulator with the same characteristics. (Fig. 1-4)

During recording, the colour signal is recorded on the magnetic tape by overlapping the FM wave of the luminance signal with a signal obtained by low range conversion to 627 kHz ± 500 kHz from the carrier colour signal 4.43 MHz ± 500 kHz by a frequency converter.
During playback, the reverse frequency conversion is performed, and the signal is synthesized with the luminance signal after removing the time axis fluctuation components occurring during playback. (Fig. 1-5)

As illustrated by the VHS system video recording signal spectrum (Fig. 1-6), the reproducible demodulation band for the luminance signal is approximately 3.2 MHz. This can be converted into a horizontal resolution of approximately 250 lines, a deterioration of approximately 150 lines from the horizontal resolution (400 lines) of the 0 to 5 MHz video signal for the PAL system described above.
For separation of the luminance signal and colour signal, a low-pass filter of approximately 3.2 MHz is used for the luminance signal and a bandpass filter of 4.43 MHz ± 500 kHz for the colour signal as the basic circuit configuration for the separation circuit.

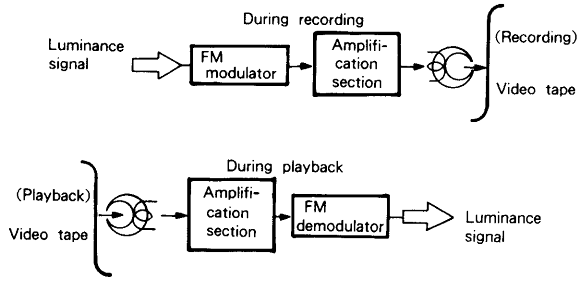

During recording
Luminance signal
FM modulator
Amplification section
(Recording)
Video tape
During playback
(Playback)
Video tape
Amplification section
FM demodulator
Luminance signal

Fig. 1-4 Recording/Playback Processing for Luminance Signal

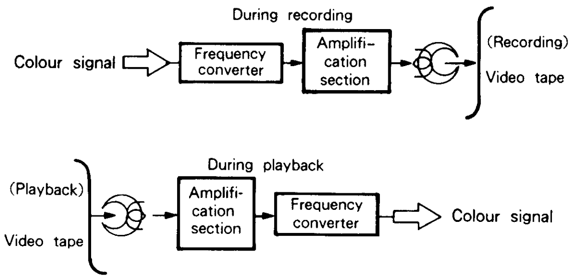

During recording
Colour signal
Frequency converter
Amplification section
(Recording)
Video tape
During playback
(Playback)
Video tape
Amplification section
Frequency converter
Colour signal

Fig. 1-5 Recording/Playback Processing for Color Signal

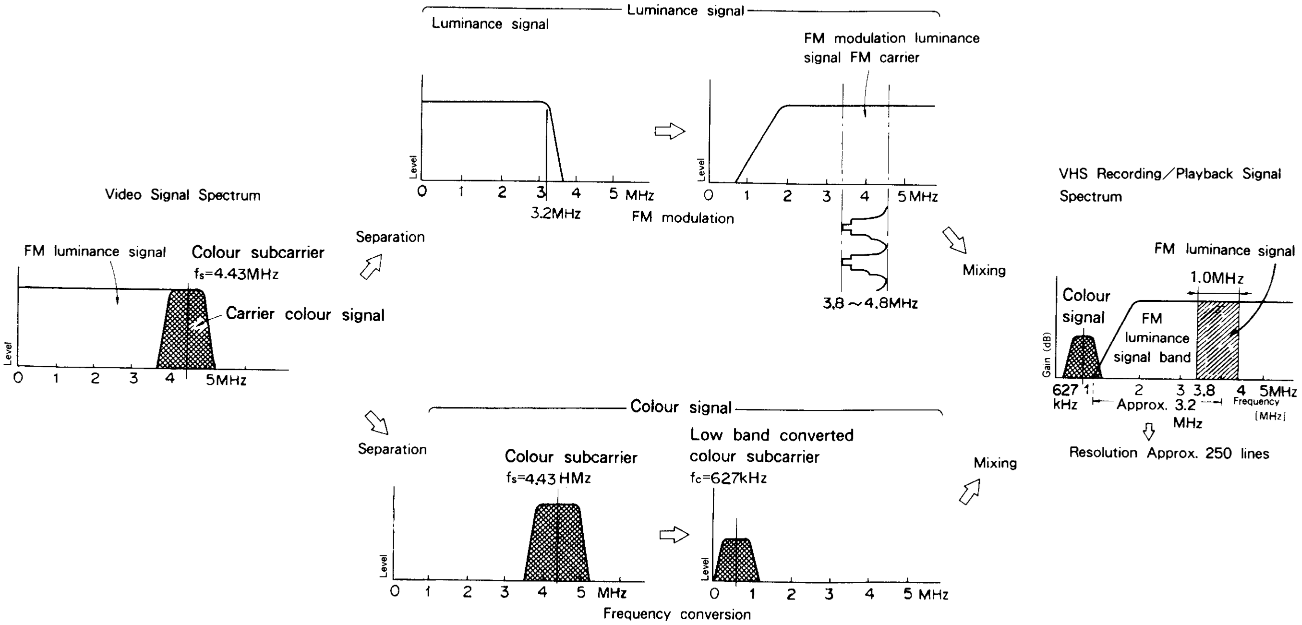


Fig. 1-6 Recording Video Signal Frequency Spectrum for VHS System

1-3. SVHS 625 VIDEO RECORDING/ PLAYBACK SYSTEM

The newly developed S-VHS system video tape recorders have recording/playback characteristics providing horizontal resolution of over 400 lines, exceeding the standards for current PAL video signals. Converting this to the recording/playback frequency band provides high band characteristics exceeding 5 MHz. However, recording/playback signal processing for S-VHS video units is the same signal processing as conventional VHS video units. The base method remains the same with luminance and colour signals separated from the PAL composite video signals, and the luminance signal converted to an FM wave and the colour signal frequency converted. (Same as Fig. 1-4 and Fig. 1-5)

In order for the S-VHS video system to provide higher picture quality without changing the basic VHS signal processing method, the band for the luminance signal circuits is increased (5 MHz) and the FM modulation frequency for the luminance signal is increased 2.6 MHz in the white peak section. As shown in the recording video signal frequency spectrum for the S-VHS system (Fig. 1-7), the sync tip signal for FM modulation is 5.4 MHz, the frequency deviation is 1.6 MHz, and the 7 MHz in the white peak section.

As a result, the reproducible demodulation band for luminance signals is 5.3 MHz for S-VHS system, a significantly higher band than the 3.2 MHz for conventional VHS system. This translates to a horizontal resolution of approximately 430 lines, a radical improvement in picture quality.

On the other hand, S-VHS video colour recording/playback signal processing performs low range frequency conversion to 627 kHz ± 500 kHz by the same method as conventional VHS, eliminating the need for changes to the circuitry.

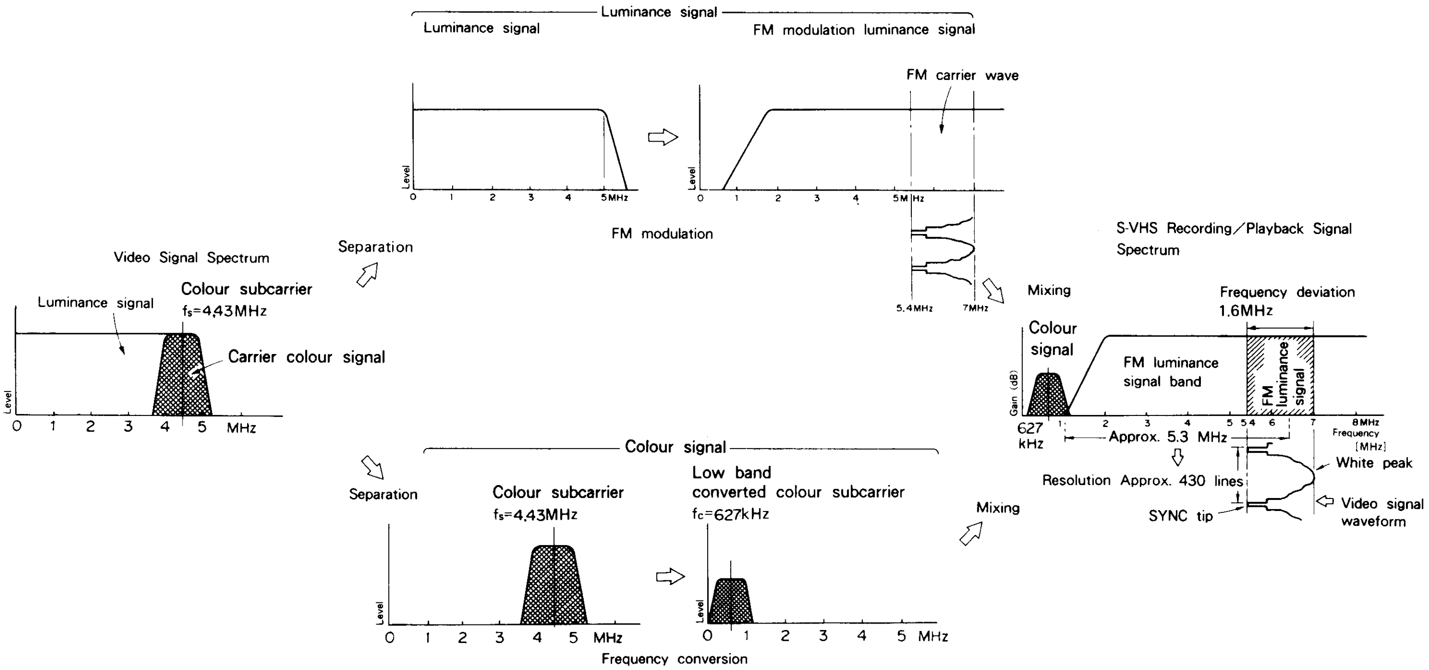

Luminance signal
Luminance signal
FM modulation luminance signal
FM carrier wave
Level
0 1 2 3 4 5MHz
0 1 2 3 4 5MHz
FM modulation
5.4MHz 7MHz
Video Signal Spectrum
Separation
Luminance signal
Colour subcarrier
fs=4.43MHz
Carrier colour signal
0 1 2 3 4 5 MHz
S-VHS Recording/Playback Signal Spectrum
Mixing
Frequency deviation 1.6MHz
Colour signal
FM luminance signal band
FM luminance signal
Gain (dB)
627 kHz
1 2 3 4 5 5.4 6 7 8MHz
Frequency [MHz]
Approx. 5.3 MHz
White peak
Resolution Approx. 430 lines
Video signal waveform
SYNC tip
Mixing
Colour signal
Separation
Colour subcarrier
fs=4.43MHz
Low band converted colour subcarrier
fc=627kHz
0 1 2 3 4 5 MHz
0 1 2 3 4 5 MHz
Frequency conversion

Fig. 1-7 Recording Video Signal Frequency Spectrum for S-VHS System

1-4. FEATURES OF SVHS 625

The S-VHS system of video recording provides such benefits as increasing the FM modulation frequency of the luminance signal by 2.6 MHz in the white peak section, expanding the FM luminance signal band, and providing a significant picture quality improvement by increasing horizontal resolution to 400 lines or more. The resulting deterioration in the S/N ratio and picture quality due to cross-luminance (dot interference) is improved in this system by improvement to the video tape, video heads, and special circuit configuration.

(1) Improvements to Video Tape and Video Heads

The high band S-VHS video system exceeds the performance of conventional VHS tape, and is realized with high performance video tape (S-VHS video tape) (Table 1-1) and video heads having a narrow gap of 0.3 µm (0.35 µm in conventional units). Thus, it is necessary to use S-VHS tape when recording with high picture quality (S-VHS). S-VHS cassette tapes are equipped with the detection hole shown in (Fig. 1-8) to discriminate between S-VHS tape and conventional VHS tape. There is automatic discrimination when the tape is inserted into the unit.

Comparison of Magnetic Characteristics of S-VHS Tape and Conventional VHS High-Grade Tape

	S-VHS Tape	Conventional VHS High-Grade Tape
Magnetic resistance (Oe)	900	670
Maximum residual flux density (Gauss)	1600	1200

Table 1-1

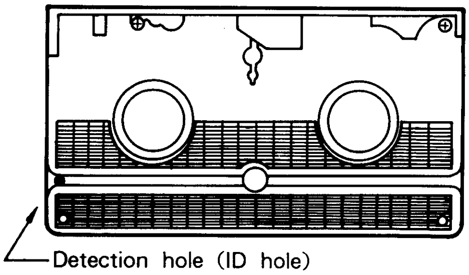


Fig. 1-8

(2) S/N Improvement by Circuit Configuration

S/N improvement for high resolution picture quality is obtained by expanding the frequency deviation (modulation level) for luminance signal FM modulation to 1.6 MHz for S-VHS from 1 MHz for conventional VHS, adding a two-stage non-linear sub-emphasis circuit (S-VHS emphasis : IC165) to the conventional main emphasis circuit, and further adding a high-performance noise canceller circuit with CCD 1H delay line.

(3) Improvement in Cross-Luminance Caused by High Band of Luminance Signal

Signal connection between conventional video equipments is performed by an PAL system composite video signal mixing the colour signal (C) and luminance signal (Y). However, deterioration in picture quality will appear due to cross colour and cross luminance (dot interference) as interference occurs between the colour signal and luminance signal, and the band of the luminance signal is increased. To prevent this, it is set up with the Y/C separation I/O terminals (S type terminals) that the Y and C signals are separated from the beginning and processed. At the same time, a high-performance comb filter is added for conventional PAL composite video signal processing. This is a Y/C separation circuit which extracts the high band luminance signals and provides improved cross colour and cross luminance.

(4) Compatibility of S-VHS and VHS

In S-VHS video units, the FM modulation/demodulation of the luminance signal processing system, S-VHS non-linear emphasis, band filter, etc., must correspond to S-VHS characteristics. In order for a single S-VHS unit to have compatibility with conventional VHS, two systems are required : the S-VHS system described above and the conventional VHS system. Thus, S-VHS video units have two luminance signal processing circuits , and compatibility is maintained by switching between the S-VHS and VHS systems.

The high band luminance signal recording/playback characteristics of S-VHS units allow for sharp reproduction of standard PAL video signals recorded from TV broadcasts in their original state with no reduction in the horizontal resolution of 400 lines. These units are also equipped with an S terminal (Y/C separation terminal) for connection of video equipment with high picture quality of more than 400 lines, exceeding the PAL standards, allowing for pictures sharper than normal TV broadcasts to be enjoyed in the home with prerecorded video tapes exclusively for S-VHS.

(5) Pilot burst signal

The chroma recording/playback signal processing method used with the S-VHS system is the same as conventional VHS, low-band frequency conversion at 627 kHz ± 500 kHz. However, the pilot burst signal shown in Fig. 1-9. is added to this chroma signal.

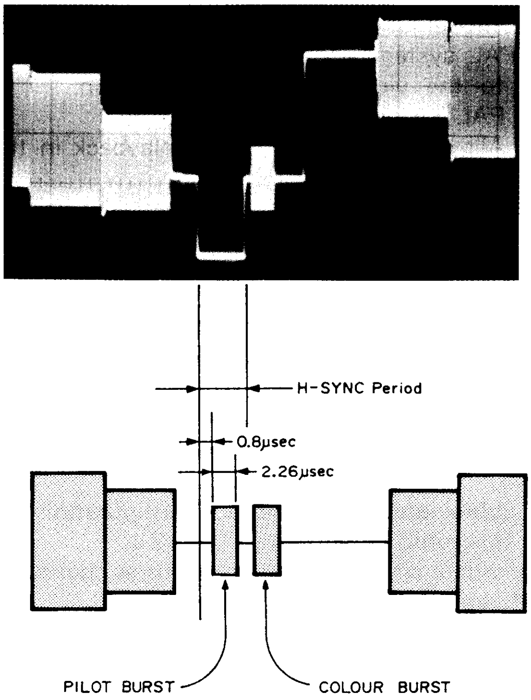
The pilot burst signal is inserted into the blanking section (H-SYNC section) of the chroma signal shown in Fig. 1-9. during recording in order to improve the playback colour S/N ratio for playback and to improve colour stability for special playback. The frequency is the same as the chroma signal and the level is the same as the colour burst signal. The most important factor for the pilot burst signal is the phase as described below.
The phase is shown in Fig. 1-10. There are two phases : 90° and 270° in relation to the U-axis of the chroma signal. Phase selection is made as shown in Table 1-2. according to the state of the video signal to be recorded.

Phase	Specifications	Concrete Example
90°	When Y high-band components are mixed with low-band conversion chroma signal	Composite video signal input such as built-in tuner or SECAM signals
270°	When Y component mixed with low-band conversion chroma signal has been sufficiently attenuated (less than − 20 dB)	Y/C separated input (S. INPUT) or comb type filter Y/C separation used

Table 1-2.

During playback, the phase of the pilot burst signal, 90° or 270° , is determined by the phase detection circuit, and used for circuit configuration switching, etc., for the chroma noise reduction (CNR) circuit, etc. In other words, the CNR circuit configuration is used to provide an improvement in the S/N ratio according to the state of the recorded chroma signal. In addition, the pilot burst signal is sometimes used as the reference signal for the chroma signal playback APC circuit. The pilot burst signal is eliminated after use for this type of playback chroma signal processing. As a result, the pilot burst signal is not contained in the final chroma signal output.
(In this unit, the pilot burst signal is inserted during recording to maintain compatibility with the S-VHS standards, but is not used for signal processing in the playback system.)

PAL COMPOSITE VIDEO SIGNAL (COLOUR BAR)



CHROMA SIGNAL WITH INSERTED PILOT BURST

Fig. 1-9 Pilot Burst Signal Insertion Position

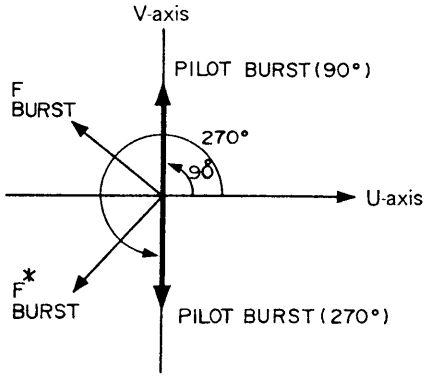


Fig. 1-10

2. VIDEO CIRCUIT DESCRIPTION

This model uses the following processing methods for PAL system signals and SECAM system signals, due to the video circuit configuration.

(1) PAL system signals
Allows both recording and playback in the VHS and S-VHS modes.
(The S-VHS mode is automatically selected for playback only for those tapes recorded in the S-VHS mode.)

(2) SECAM system signals (model for MESECAM)
- Recording and playback using MESECAM system is possible only in the VHS mode.
- S-VHS mode cannot be selected.

2-1. VIDEO CIRCUIT CONFIGURATION

An abbreviated video circuit configuration diagram for this unit is shown in Fig. 2-1.
The video circuit consists of three boards : VP-1, VD-1, and CP-2.

(1) VP-1 board circuit configuration
Video head recording amplifier circuit, video head playback amplifier circuit (IC181)

(2) VD-1 board circuit configuration
VHS/S-VHS Y signal processing circuit (IC101, IC108), Y signal noise canceller circuit (IC101 and surrounding circuit), chroma signal processing circuit

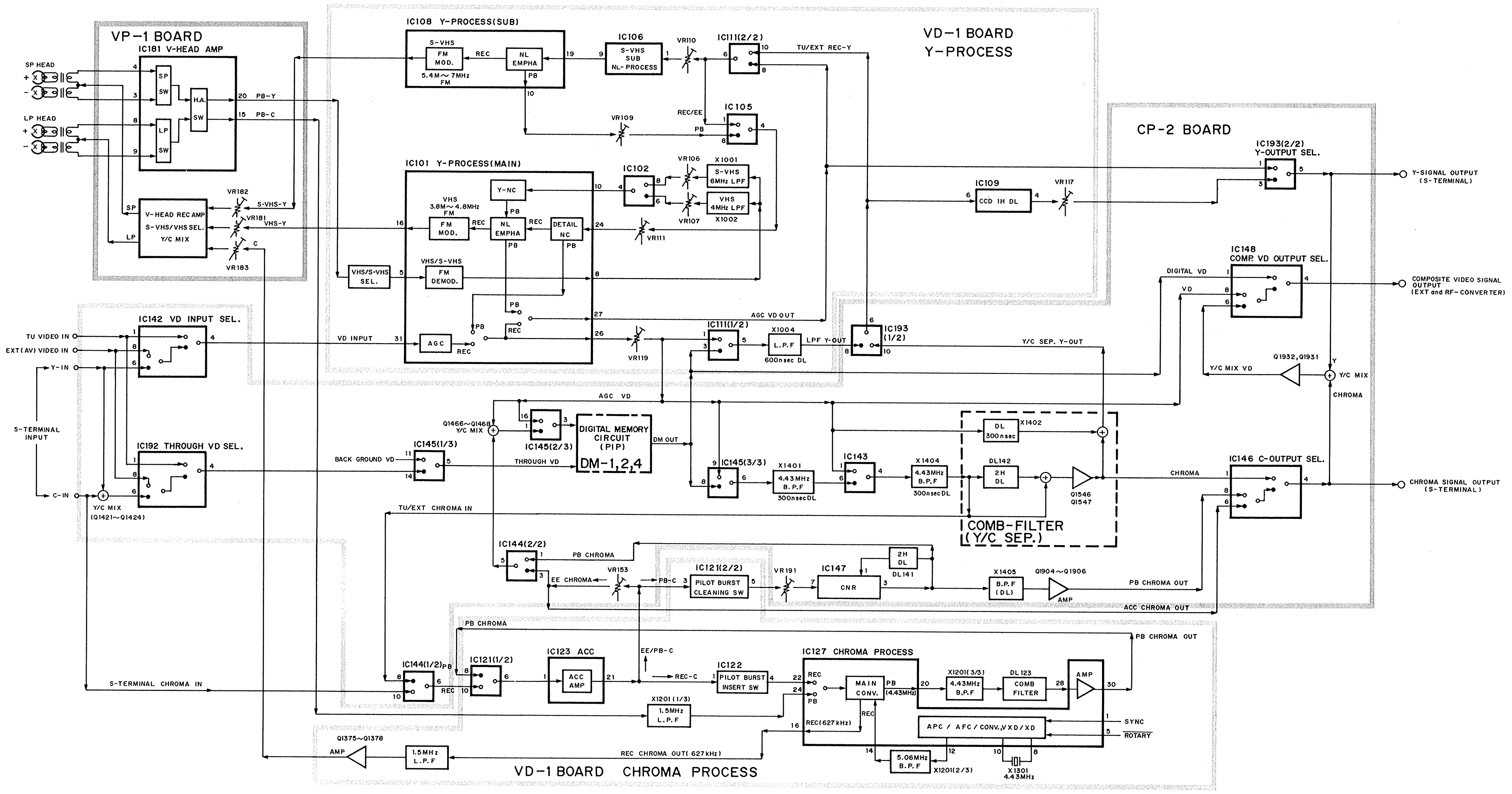
(3) CP-2 board circuit configuration
Video signal input/output select circuit, noise canceller circuit (CNR), comb type filter (Y/C separation) circuit, memory signal/normal signal select circuit

2-2. VIDEO SIGNAL PROCESSING PATH

In this unit equipped with the high-band S-VHS mode and P-in-P memory functions, the signal processing path varies according to the input signal type (composite video signal / Y/C separation signal), input signal system (PAL/SECAM), and various modes (P-in-P mode, REC/PB mode, etc.). Fig. 2-2. through Fig. 2-8. show the signal processing paths for the various modes.

ⓐ Fig. 2-2. : PAL system TU/EXT video signal input in REC/EE mode
ⓑ Fig. 2-3. : S-Terminal signal input (PAL/SECAM) in REC/EE mode
ⓒ Fig. 2-4. : SECAM system TU/EXT video signal input in REC/EE mode
ⓓ Fig. 2-5. : TU/EXT video signal input in P-in-P mode (EE mode)
ⓔ Fig. 2-6. : S-Terminal signal input in P-in-P mode (EE mode)
ⓕ Fig. 2-7. : Playback mode
ⓖ Fig. 2-8. : Playback P-in-P mode

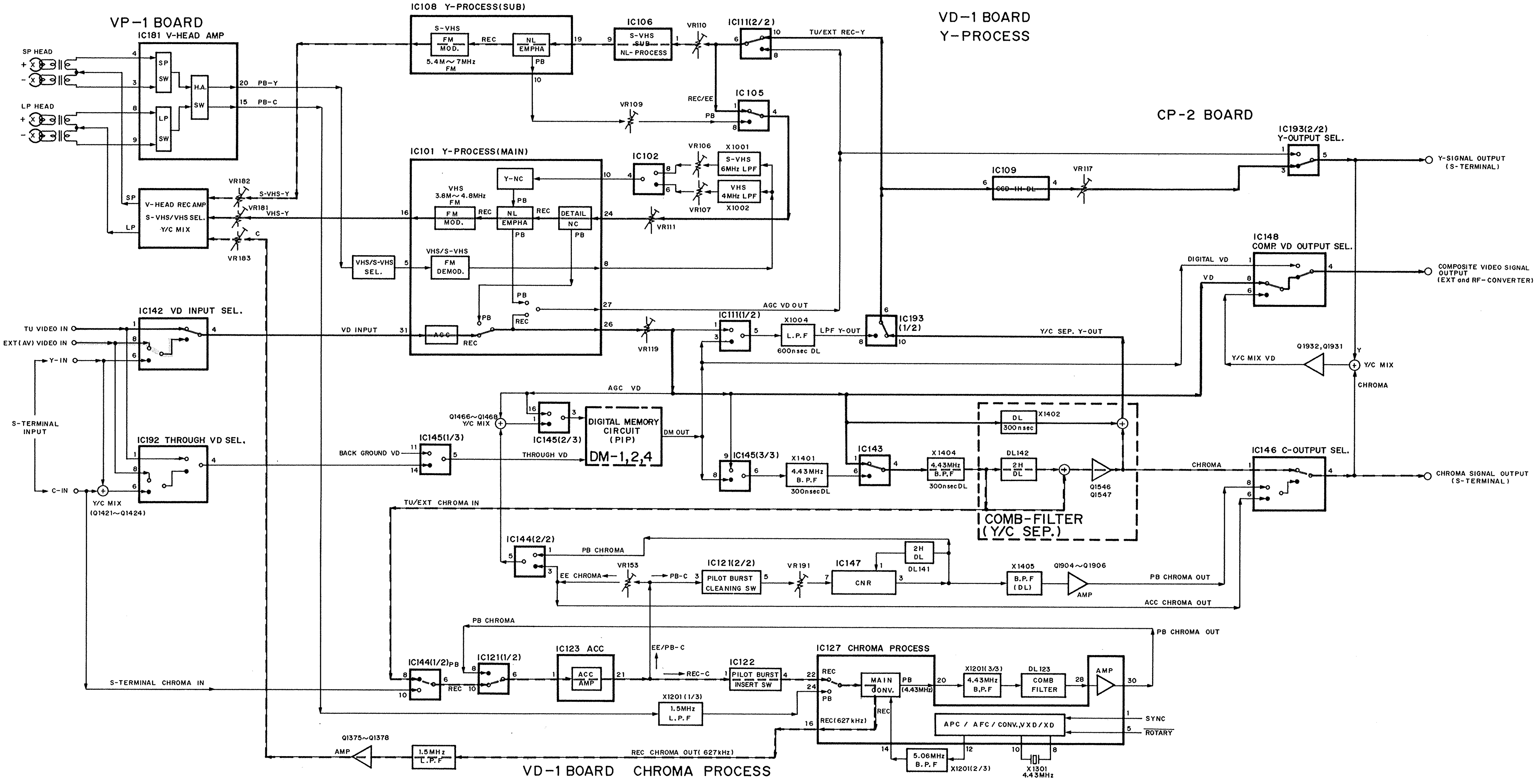
VIDEO CIRCUIT OUTLINE


VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP SW
LP SW
H.A. SW
20 PB-Y
15 PB-C
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
VR182
VR181
VR183
S-VHS-Y
VHS-Y
C
IC108 Y-PROCESS(SUB)
S-VHS FM MOD.
5.4M～7MHz FM
REC
NL EMPHA
PB
IC106 S-VHS SUB NL-PROCESS
VR110
IC111(2/2)
TU/EXT REC-Y
VD-1 BOARD
Y-PROCESS
VR109
REC/EE
IC105
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M～4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
IC102
VR106
X1001
S-VHS 6MHz LPF
VHS 4MHz LPF
VR107
X1002
VR111
VHS/S-VHS SEL.
VHS/S-VHS FM DEMOD.
AGC
VD INPUT
27 AGC VD OUT
26
VR119
IC111(1/2)
X1004 L.P.F 600nsec DL
LPF Y-OUT
IC193 (1/2)
Y/C SEP. Y-OUT
CP-2 BOARD
IC193(2/2) Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC109 CCD 1H DL
VR117
IC148 COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
Q1932,Q1931
Y/C MIX VD
Y/C MIX
Y
CHROMA
IC142 VD INPUT SEL.
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
S-TERMINAL INPUT
C-IN
Y/C MIX (Q1421～Q1424)
IC192 THROUGH VD SEL.
AGC VD
Q1466～Q1468 Y/C MIX
IC145(2/3)
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
IC145(1/3)
BACK GROUND VD
THROUGH VD
IC145(3/3)
X1401 4.43MHz B.P.F 300nsec DL
IC143
X1404 4.43MHz B.P.F 300nsec DL
DL 300nsec X1402
DL142 2H DL
Q1546 Q1547
COMB-FILTER (Y/C SEP.)
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
TU/EXT CHROMA IN
IC144(2/2)
PB CHROMA
EE CHROMA
VR153
PB-C
IC121(2/2) PILOT BURST CLEANING SW
VR191
IC147 CNR
2H DL DL141
X1405 B.P.F (DL)
Q1904～Q1906 AMP
PB CHROMA OUT
ACC CHROMA OUT
PB CHROMA
S-TERMINAL CHROMA IN
IC144(1/2)
IC121(1/2)
REC
IC123 ACC
ACC AMP
EE/PB-C
REC-C
IC122 PILOT BURST INSERT SW
IC127 CHROMA PROCESS
MAIN CONV.
PB (4.43MHz)
X1201(3/3) 4.43MHz B.P.F
DL123 COMB FILTER
AMP
PB CHROMA OUT
X1201(1/3) 1.5MHz L.P.F
REC(627kHz)
APC / AFC / CONV.VXD/XD
SYNC
ROTARY
5.06MHz B.P.F X1201(2/3)
X1301 4.43MHz
Q1375～Q1378 AMP
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
VD-1 BOARD CHROMA PROCESS

▨ VD-1 BOARD
▨ CP-2 BOARD
▨ VP-1 BOARD

Fig. 2-1

ⓐREC/EE mode, TU/EXT PAL system Video Input



VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP SW
LP SW
H.A. SW
20 PB-Y
15 PB-C
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
VR182
VR181
VR183
S-VHS-Y
VHS-Y
C
IC108 Y-PROCESS(SUB)
S-VHS
FM MOD.
5.4M~7MHz FM
REC
NL EMPHA
PB
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M~4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
VHS/S-VHS
FM DEMOD.
VHS/S-VHS SEL.
AGC
VD INPUT
IC106
S-VHS SUB NL-PROCESS
VR110
VR109
VR106
VR107
VR111
VR119
IC111(2/2)
TU/EXT REC-Y
IC105
REC/EE
IC102
X1001
S-VHS 6MHz LPF
VHS 4MHz LPF
X1002
AGC VD OUT
IC111(1/2)
X1004
L.P.F
600nsec DL
LPF Y-OUT
IC193 (1/2)
Y/C SEP. Y-OUT
VD-1 BOARD
Y-PROCESS
CP-2 BOARD
IC193(2/2)
Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC109
CCD-1H-DL
VR117
IC148
COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
Q1932,Q1931
Y/C MIX VD
Y/C MIX
CHROMA
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
C-IN
S-TERMINAL INPUT
IC142 VD INPUT SEL.
IC192 THROUGH VD SEL.
Y/C MIX (Q1421~Q1424)
AGC VD
Q1466~Q1468 Y/C MIX
IC145(2/3)
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
IC145(1/3)
BACK GROUND VD
THROUGH VD
IC145(3/3)
X1401
4.43MHz B.P.F
300nsecDL
IC143
X1404
4.43MHz B.P.F
300nsecDL
DL 300nsec
X1402
DL142
2H DL
Q1546 Q1547
COMB-FILTER (Y/C SEP.)
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
TU/EXT CHROMA IN
IC144(2/2)
PB CHROMA
EE CHROMA
VR153
PB-C
IC121(2/2)
PILOT BURST CLEANING SW
VR191
IC147
CNR
2H DL
DL141
X1405
B.P.F (DL)
Q1904~Q1906
AMP
PB CHROMA OUT
ACC CHROMA OUT
S-TERMINAL CHROMA IN
IC144(1/2)
IC121(1/2)
IC123 ACC
ACC AMP
EE/PB-C
REC-C
IC122
PILOT BURST INSERT SW
X1201(1/3)
1.5MHz L.P.F
IC127 CHROMA PROCESS
MAIN CONV.
PB (4.43MHz)
REC(627kHz)
X1201(3/3)
4.43MHz B.P.F
DL123
COMB FILTER
AMP
APC / AFC / CONV.,VXD/XD
SYNC
ROTARY
5.06MHz B.P.F
X1201(2/3)
X1301 4.43MHz
Q1375~Q1378
AMP
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
VD-1 BOARD CHROMA PROCESS

▬▬▬ Composite Video Signal Flow

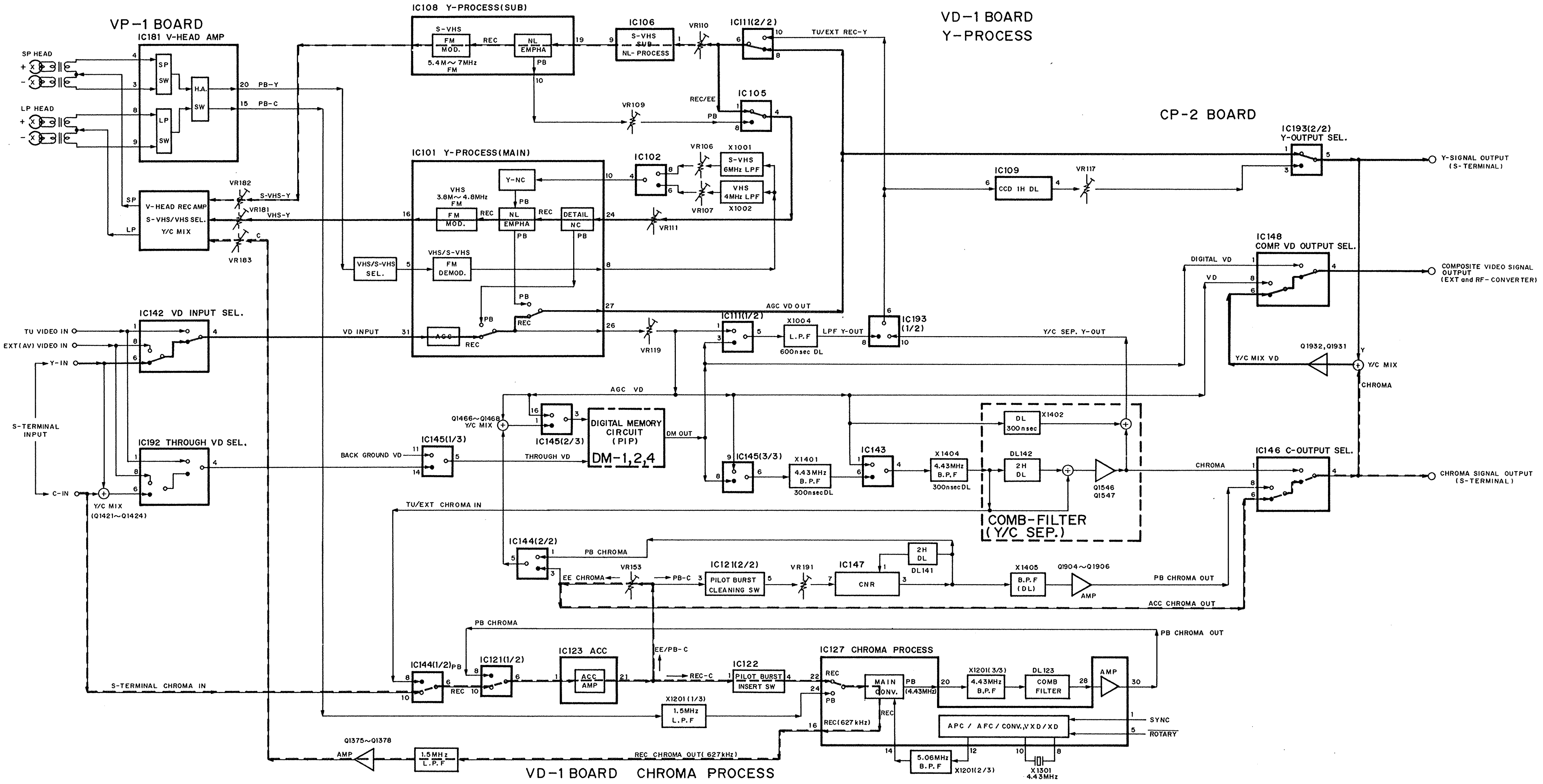
▬▬▬ Y (Luminance)-Signal Flow

▬ ▬ ▬ S-VHS mode Y-Rec. Signal

▬ ▬ ▬ C (Chrominance)-Signal Flow

Fig. 2-2

ⓑREC/EE mode, S-Terminal Input
(VHS MESECAM system Recording only in SECAM Signal)

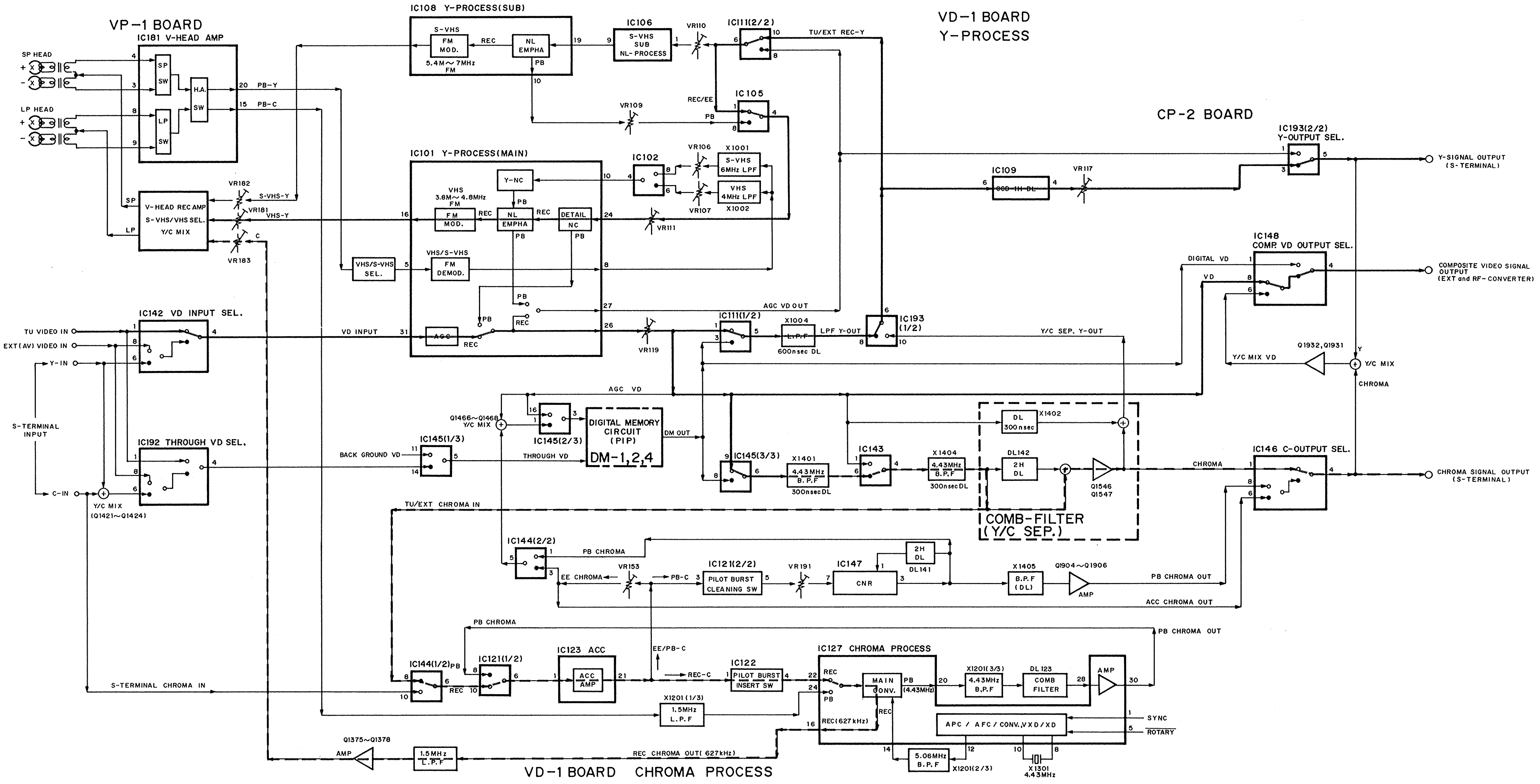

VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP
SW
LP
H.A.
PB-Y
PB-C
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
VR182
VR181
VR183
S-VHS-Y
VHS-Y
IC108 Y-PROCESS(SUB)
S-VHS
FM MOD.
REC
NL EMPHA
PB
5.4M~7MHz FM
IC106
S-VHS SUB NL-PROCESS
VR110
IC111(2/2)
TU/EXT REC-Y
VD-1 BOARD
Y-PROCESS
IC105
REC/EE
VR109
CP-2 BOARD
IC193(2/2)
Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M~4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
IC102
VR106
X1001
S-VHS 6MHz LPF
VHS 4MHz LPF
VR107
X1002
VR111
IC109
CCD 1H DL
VR117
VHS/S-VHS SEL.
VHS/S-VHS
FM DEMOD.
IC148
COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
IC142 VD INPUT SEL.
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
VD INPUT
AGC
AGC VD OUT
VR119
IC111(1/2)
X1004
L.P.F
600nsec DL
LPF Y-OUT
IC193 (1/2)
Y/C SEP. Y-OUT
Q1932,Q1931
Y/C MIX VD
Y/C MIX
CHROMA
AGC VD
Q1466~Q1468 Y/C MIX
IC145(2/3)
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
DL
X1402
300nsec
S-TERMINAL INPUT
IC192 THROUGH VD SEL.
IC145(1/3)
BACK GROUND VD
THROUGH VD
IC145(3/3)
X1401
4.43MHz B.P.F
300nsecDL
IC143
X1404
4.43MHz B.P.F
300nsecDL
DL142
2H DL
Q1546 Q1547
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
C-IN
Y/C MIX (Q1421~Q1424)
TU/EXT CHROMA IN
COMB-FILTER (Y/C SEP.)
IC144(2/2)
PB CHROMA
2H DL
DL141
VR153
EE CHROMA
PB-C
IC121(2/2)
PILOT BURST CLEANING SW
VR191
IC147
CNR
X1405
B.P.F (DL)
Q1904~Q1906
AMP
PB CHROMA OUT
ACC CHROMA OUT
PB CHROMA
PB CHROMA OUT
IC144(1/2)
IC121(1/2)
IC123 ACC
ACC AMP
EE/PB-C
IC122
REC-C
PILOT BURST INSERT SW
IC127 CHROMA PROCESS
MAIN CONV.
(4.43MHz)
X1201(3/3)
4.43MHz B.P.F
DL123
COMB FILTER
S-TERMINAL CHROMA IN
X1201(1/3)
1.5MHz L.P.F
REC(627kHz)
APC / AFC / CONV.,VXD/XD
SYNC
ROTARY
Q1375~Q1378
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
5.06MHz B.P.F
X1201(2/3)
X1301 4.43MHz
VD-1 BOARD CHROMA PROCESS

MC-Service

━━━ Composite Video Signal Flow
━━━ Y (Luminance)-Signal Flow
╍╍╍ S-VHS mode Y-Rec. Signal
╍╍╍ C (Chrominance)-Signal Flow

Fig. 2-3

©REC/EE mode, TU/EXT SECAM system Video Imput
(VHS MESECAM system Recording only in SECAM Signal)



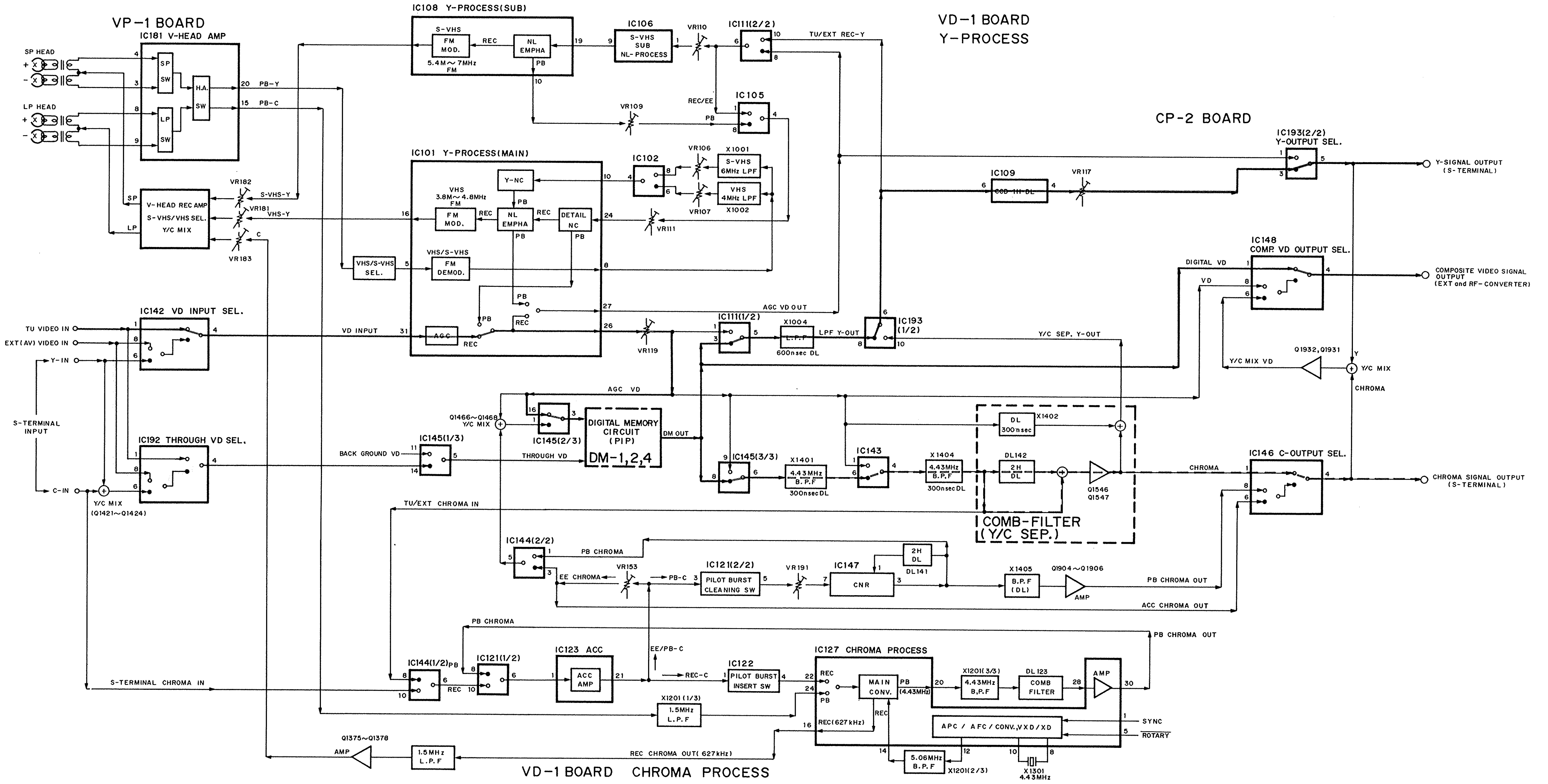
VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP
SW
LP
SW
H.A.
SW
20 PB-Y
15 PB-C
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
VR182
VR181
VR183
S-VHS-Y
VHS-Y
C
IC108 Y-PROCESS(SUB)
S-VHS
FM MOD.
5.4M~7MHz FM
REC
NL EMPHA
PB
IC106
S-VHS SUB NL-PROCESS
VR110
IC111(2/2)
TU/EXT REC-Y
VR109
REC/EE
IC105
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M~4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
VHS/S-VHS
FM DEMOD.
VHS/S-VHS SEL.
IC102
VR106
VR107
X1001
S-VHS 6MHz LPF
VHS 4MHz LPF
X1002
VR111
AGC VD OUT
VD INPUT
AGC
VR119
IC111(1/2)
X1004
L.P.F
600nsec DL
LPF Y-OUT
IC193 (1/2)
VD-1 BOARD
Y-PROCESS
CP-2 BOARD
IC193(2/2) Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC109
CCD 1H DL
VR117
IC148 COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
Y/C SEP. Y-OUT
Q1932,Q1931
Y/C MIX VD
Y/C MIX
CHROMA
IC142 VD INPUT SEL.
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
S-TERMINAL INPUT
C-IN
Y/C MIX (Q1421~Q1424)
IC192 THROUGH VD SEL.
AGC VD
Q1466~Q1468 Y/C MIX
IC145(2/3)
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
IC145(1/3)
BACK GROUND VD
THROUGH VD
IC145(3/3)
X1401
4.43MHz B.P.F
300nsec DL
IC143
X1404
4.43MHz B.P.F
300nsec DL
DL 300nsec
X1402
DL142
2H DL
Q1546 Q1547
COMB-FILTER (Y/C SEP.)
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
TU/EXT CHROMA IN
IC144(2/2)
PB CHROMA
EE CHROMA
VR153
PB-C
IC121(2/2)
PILOT BURST CLEANING SW
VR191
IC147
CNR
2H DL
DL141
X1405
B.P.F (DL)
Q1904~Q1906
AMP
PB CHROMA OUT
ACC CHROMA OUT
IC144(1/2)
IC121(1/2)
IC123 ACC
ACC AMP
EE/PB-C
IC122
REC-C
PILOT BURST INSERT SW
X1201(1/3)
1.5MHz L.P.F
IC127 CHROMA PROCESS
MAIN CONV.
(4.43MHz)
REC(627kHz)
X1201(3/3)
4.43MHz B.P.F
DL123
COMB FILTER
AMP
APC / AFC / CONV.,VXD/XD
SYNC
ROTARY
5.06MHz B.P.F
X1201(2/3)
X1301 4.43MHz
S-TERMINAL CHROMA IN
Q1375~Q1378
AMP
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
VD-1 BOARD CHROMA PROCESS

MC-Service

Fig. 2-4

▬▬▬ **Composite Video Signal Flow**
▬▬▬ **Y (Luminance)-Signal Flow**
▬ ▬ ▬ **C (Chrominance)-Signal Flow**

ⓓP-in-P-Digital mode (EE), TU/EXT Video Input

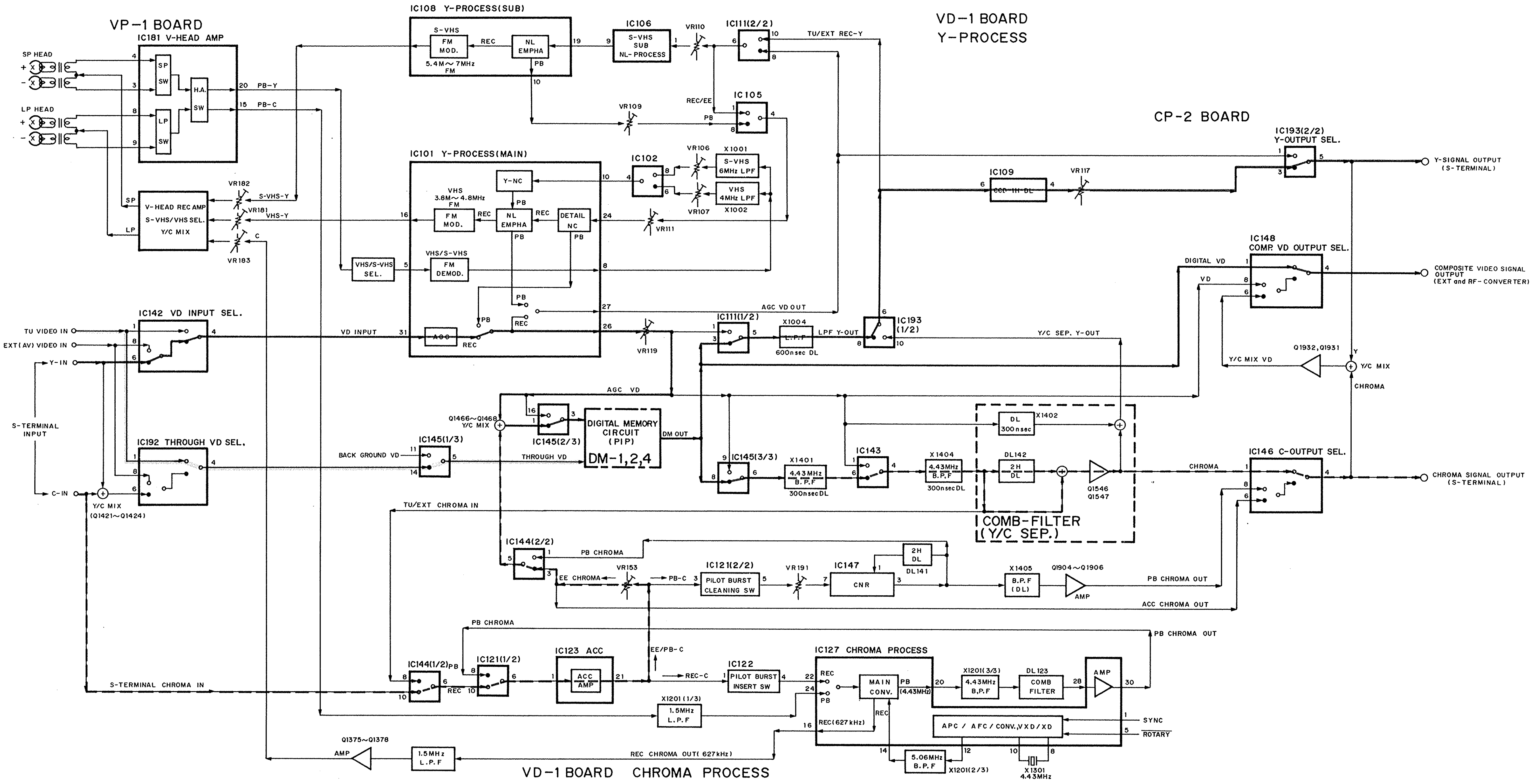

VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP SW
LP SW
H.A. SW
20 PB-Y
15 PB-C
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
VR182
VR181
VR183
S-VHS-Y
VHS-Y
C
IC108 Y-PROCESS(SUB)
S-VHS
FM MOD.
5.4M～7MHz FM
REC
NL EMPHA
PB
IC106
S-VHS SUB NL-PROCESS
VR110
IC111(2/2)
TU/EXT REC-Y
IC105
VR109
REC/EE
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M～4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
VHS/S-VHS
FM DEMOD.
VHS/S-VHS SEL.
AGC
VD INPUT
IC102
VR106
VR107
VR111
X1001
S-VHS 6MHz LPF
VHS 4MHz LPF
X1002
AGC VD OUT
VR119
IC111(1/2)
X1004
L.P.F
600nsec DL
LPF Y-OUT
IC193 (1/2)
Y/C SEP. Y-OUT
VD-1 BOARD
Y-PROCESS
CP-2 BOARD
IC193(2/2)
Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC109
CCD 1H DL
VR117
IC148
COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
Q1932,Q1931
Y/C MIX VD
Y/C MIX
CHROMA
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
S-TERMINAL INPUT
C-IN
IC142 VD INPUT SEL.
IC192 THROUGH VD SEL.
Y/C MIX (Q1421～Q1424)
AGC VD
Q1466～Q1468 Y/C MIX
IC145(2/3)
IC145(1/3)
BACK GROUND VD
THROUGH VD
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
IC145(3/3)
X1401
4.43MHz B.P.F
300nsec DL
IC143
X1404
4.43MHz B.P.F
300nsec DL
DL 300nsec
X1402
DL142
2H DL
Q1546 Q1547
COMB-FILTER (Y/C SEP.)
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
TU/EXT CHROMA IN
IC144(2/2)
PB CHROMA
EE CHROMA
VR153
PB-C
IC121(2/2)
PILOT BURST CLEANING SW
VR191
IC147
CNR
2H DL
DL141
X1405
B.P.F (DL)
Q1904～Q1906
AMP
PB CHROMA OUT
ACC CHROMA OUT
S-TERMINAL CHROMA IN
IC144(1/2)
IC121(1/2)
IC123 ACC
ACC AMP
EE/PB-C
REC-C
IC122
PILOT BURST INSERT SW
X1201(1/3)
1.5MHz L.P.F
IC127 CHROMA PROCESS
MAIN CONV.
PB (4.43MHz)
REC(627kHz)
X1201(3/3)
4.43MHz B.P.F
DL123
COMB FILTER
AMP
APC / AFC / CONV.,VXD/XD
SYNC
ROTARY
5.06MHz B.P.F
X1201(2/3)
X1301 4.43MHz
Q1375～Q1378
AMP
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
VD-1 BOARD CHROMA PROCESS

MC-Service

Fig. 2-5

▬▬ Composite Video Signal Flow
▭▭ Sub-Picture Signal Flow
▬▬ Y (Luminance)-Signal Flow
▬ ▬ ▬ C (Chrominance)-Signal Flow

⑥P-in-P Digital mode (EE), S-Terminal Input


VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP SW
LP SW
H.A. SW
PB-Y
PB-C
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
VR182
VR181
VR183
S-VHS-Y
VHS-Y
IC108 Y-PROCESS(SUB)
S-VHS FM MOD.
NL EMPHA
5.4M～7MHz FM
IC106 S-VHS SUB NL-PROCESS
VR110
IC111(2/2)
TU/EXT REC-Y
VR109
REC/EE
IC105
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M～4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
VHS/S-VHS FM DEMOD.
VHS/S-VHS SEL.
AGC
IC102
VR106
VR107
X1001 S-VHS 6MHz LPF
X1002 VHS 4MHz LPF
VR111
AGC VD OUT
VR119
VD-1 BOARD
Y-PROCESS
CP-2 BOARD
IC193(2/2) Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC109 CCD 1H DL
VR117
IC148 COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
IC142 VD INPUT SEL.
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
S-TERMINAL INPUT
C-IN
VD INPUT
IC111(1/2)
X1004 L.P.F 600nsec DL
LPF Y-OUT
IC193 (1/2)
Y/C SEP. Y-OUT
Q1932,Q1931
Y/C MIX VD
Y/C MIX
CHROMA
AGC VD
Q1466～Q1468 Y/C MIX
IC145(1/3)
BACK GROUND VD
IC145(2/3)
THROUGH VD
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
IC145(3/3)
X1401 4.43MHz B.P.F 300nsecDL
IC143
X1404 4.43MHz B.P.F 300nsecDL
DL 300nsec X1402
DL142 2H DL
Q1546 Q1547
COMB-FILTER (Y/C SEP.)
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
IC192 THROUGH VD SEL.
Y/C MIX (Q1421～Q1424)
TU/EXT CHROMA IN
IC144(2/2)
PB CHROMA
EE CHROMA
VR153
PB-C
IC121(2/2) PILOT BURST CLEANING SW
VR191
IC147 CNR
2H DL DL141
X1405 B.P.F (DL)
Q1904～Q1906 AMP
PB CHROMA OUT
ACC CHROMA OUT
S-TERMINAL CHROMA IN
IC144(1/2)
IC121(1/2)
IC123 ACC
ACC AMP
EE/PB-C
REC-C
IC122 PILOT BURST INSERT SW
X1201(1/3) 1.5MHz L.P.F
IC127 CHROMA PROCESS
MAIN CONV.
(4.43MHz)
REC(627kHz)
X1201(3/3) 4.43MHz B.P.F
DL123 COMB FILTER
AMP
APC / AFC / CONV.,VXD / XD
SYNC
ROTARY
5.06MHz B.P.F X1201(2/3)
X1301 4.43MHz
Q1375～Q1378 AMP
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
VD-1 BOARD CHROMA PROCESS

▬▬▬ Composite Video Signal Flow

░░░ Sub-Picture Signal Flow

▬▬▬ Y (Luminance)-Signal Flow

▬ ▬ ▬ C (Chrominance)-Signal Flow

Fig. 2-6

ⓕPLAYBACK mode

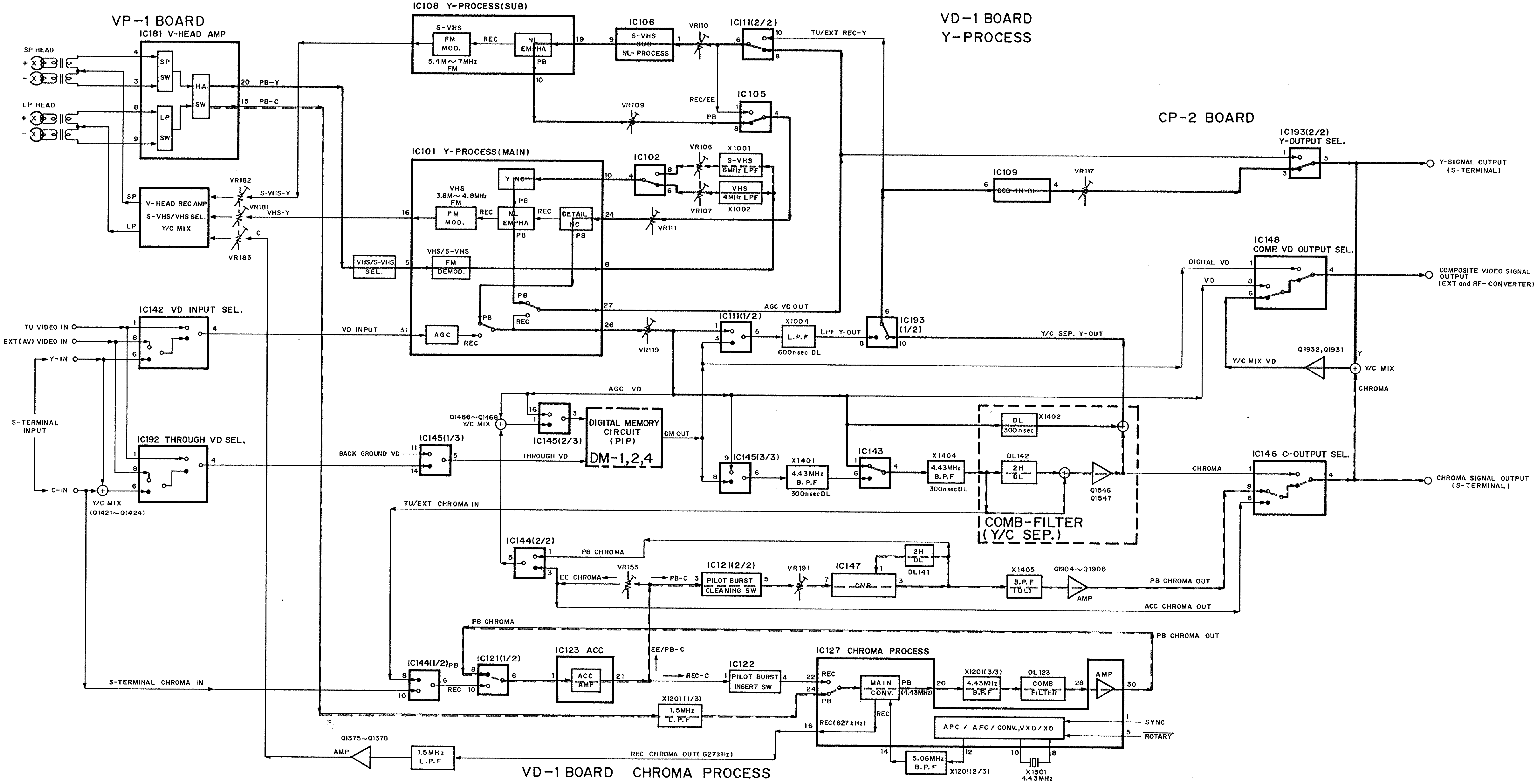
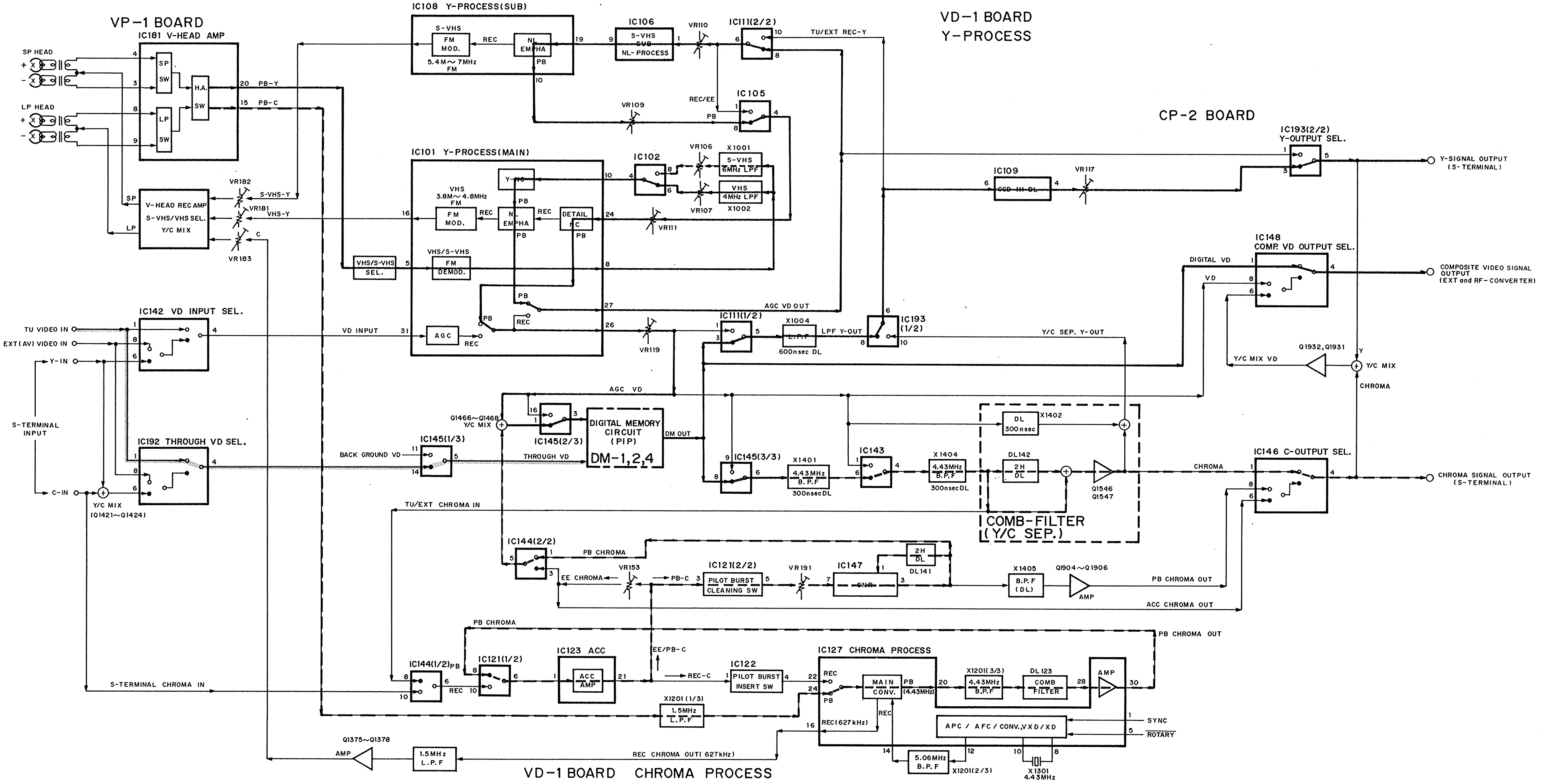

VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP SW
LP SW
H.A. SW
20 PB-Y
15 PB-C
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
VR182
VR181
VR183
S-VHS-Y
VHS-Y
C
IC108 Y-PROCESS(SUB)
S-VHS FM MOD.
5.4M～7MHz FM
REC
NL EMPHA
PB
IC106 S-VHS SUB NL-PROCESS
VR110
IC111(2/2)
TU/EXT REC-Y
IC105
REC/EE
VR109
VD-1 BOARD
Y-PROCESS
CP-2 BOARD
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M～4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
VHS/S-VHS FM DEMOD.
VHS/S-VHS SEL.
AGC
IC102
VR106
X1001 S-VHS 6MHz LPF
VHS 4MHz LPF
VR107
X1002
VR111
AGC VD OUT
VR119
IC111(1/2)
X1004 L.P.F
600nsec DL
LPF Y-OUT
IC193 (1/2)
Y/C SEP. Y-OUT
IC109 COB-1H-DL
VR117
IC193(2/2) Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC148 COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
Y/C MIX VD
Q1932,Q1931
Y/C MIX
CHROMA
IC142 VD INPUT SEL.
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
VD INPUT
S-TERMINAL INPUT
C-IN
Y/C MIX (Q1421～Q1424)
IC192 THROUGH VD SEL.
AGC VD
Q1466～Q1468 Y/C MIX
IC145(2/3)
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
IC145(1/3)
BACK GROUND VD
THROUGH VD
IC145(3/3)
X1401 4.43MHz B.P.F 300nsecDL
IC143
X1404 4.43MHz B.P.F 300nsecDL
DL 300nsec X1402
DL142 2H DL
Q1546 Q1547
COMB-FILTER (Y/C SEP.)
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
TU/EXT CHROMA IN
IC144(2/2)
PB CHROMA
EE CHROMA
VR153
PB-C
IC121(2/2) PILOT BURST CLEANING SW
VR191
IC147 CNR
2H DL DL141
X1405 B.P.F (DL)
Q1904～Q1906 AMP
PB CHROMA OUT
ACC CHROMA OUT
PB CHROMA
PB CHROMA OUT
S-TERMINAL CHROMA IN
IC144(1/2)
IC121(1/2)
IC123 ACC AMP
EE/PB-C
REC-C
IC122 PILOT BURST INSERT SW
IC127 CHROMA PROCESS
MAIN CONV.
PB (4.43MHz)
REC(627kHz)
X1201(3/3) 4.43MHz B.P.F
DL123 COMB FILTER
AMP
APC / AFC / CONV.,VXD / XD
SYNC
ROTARY
X1201(1/3) 1.5MHz L.P.F
Q1375～Q1378 AMP
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
5.06MHz B.P.F X1201(2/3)
X1301 4.43MHz
VD-1 BOARD CHROMA PROCESS

Fig. 2-7

MC-Service

▬▬▬ Composite Video Signal Flow
▬▬▬ Y (Luminance)-Signal Flow
▬ ▬ ▬ S-VHS Y-Signal Flow
▬ ▬ ▬ C (Chrominance)-Signal Flow

ⓖPLAYBACK/P-in-P mode


VP-1 BOARD
IC181 V-HEAD AMP
SP HEAD
LP HEAD
SP
SW
LP
SW
H.A.
SW
PB-Y
PB-C
VR182
S-VHS-Y
VR181
VHS-Y
C
VR183
V-HEAD REC AMP
S-VHS/VHS SEL.
Y/C MIX
IC108 Y-PROCESS(SUB)
S-VHS
FM MOD.
5.4M～7MHz FM
REC
NL EMPHA
PB
IC106
S-VHS SUB NL-PROCESS
VR110
IC111(2/2)
TU/EXT REC-Y
VD-1 BOARD
Y-PROCESS
VR109
REC/EE
IC105
IC101 Y-PROCESS(MAIN)
Y-NC
VHS 3.8M～4.8MHz FM
FM MOD.
NL EMPHA
DETAIL NC
IC102
VR106
X1001
S-VHS 6MHz LPF
VHS 4MHz LPF
VR107
X1002
VR111
VHS/S-VHS SEL.
VHS/S-VHS FM DEMOD.
AGC
AGC VD OUT
VR119
IC111(1/2)
X1004
L.P.F
600nsec DL
LPF Y-OUT
IC193 (1/2)
Y/C SEP. Y-OUT
CP-2 BOARD
IC193(2/2) Y-OUTPUT SEL.
Y-SIGNAL OUTPUT (S-TERMINAL)
IC109
CCD 1H DL
VR117
IC148 COMP. VD OUTPUT SEL.
DIGITAL VD
VD
COMPOSITE VIDEO SIGNAL OUTPUT (EXT and RF-CONVERTER)
Q1932,Q1931
Y/C MIX VD
Y/C MIX
CHROMA
IC142 VD INPUT SEL.
TU VIDEO IN
EXT(AV) VIDEO IN
Y-IN
VD INPUT
S-TERMINAL INPUT
C-IN
Y/C MIX (Q1421～Q1424)
IC192 THROUGH VD SEL.
AGC VD
Q1466～Q1468 Y/C MIX
IC145(2/3)
DIGITAL MEMORY CIRCUIT (PIP)
DM-1,2,4
DM OUT
IC145(1/3)
BACK GROUND VD
THROUGH VD
IC145(3/3)
X1401
4.43MHz B.P.F
300nsecDL
IC143
X1404
4.43MHz B.P.F
300nsecDL
DL X1402 300nsec
DL142 2H DL
Q1546 Q1547
COMB-FILTER (Y/C SEP.)
IC146 C-OUTPUT SEL.
CHROMA SIGNAL OUTPUT (S-TERMINAL)
TU/EXT CHROMA IN
IC144(2/2)
PB CHROMA
EE CHROMA
VR153
PB-C
IC121(2/2)
PILOT BURST CLEANING SW
VR191
IC147
CNR
2H DL
DL141
X1405
B.P.F (DL)
Q1904～Q1906
AMP
PB CHROMA OUT
ACC CHROMA OUT
PB CHROMA
PB CHROMA OUT
IC144(1/2)
IC121(1/2)
IC123 ACC
ACC AMP
EE/PB-C
REC-C
IC122
PILOT BURST INSERT SW
IC127 CHROMA PROCESS
MAIN CONV.
(4.43MHz)
X1201(3/3)
4.43MHz B.P.F
DL123
COMB FILTER
AMP
X1201(1/3)
1.5MHz L.P.F
REC(627kHz)
APC / AFC / CONV.,VXD/XD
SYNC
ROTARY
5.06MHz B.P.F
X1201(2/3)
X1301 4.43MHz
S-TERMINAL CHROMA IN
Q1375～Q1378
AMP
1.5MHz L.P.F
REC CHROMA OUT(627kHz)
VD-1 BOARD CHROMA PROCESS

▬▬▬ Composite Video Signal Flow
░░░ Sub-Picture Signal Flow
▬▬▬ Y (Luminance)-Signal Flow
▬ ▬ ▬ S-VHS Y-Signal Flow
▬ ▬ ▬ C (Chrominance)-Signal Flow

MC-Service

Fig. 2-8

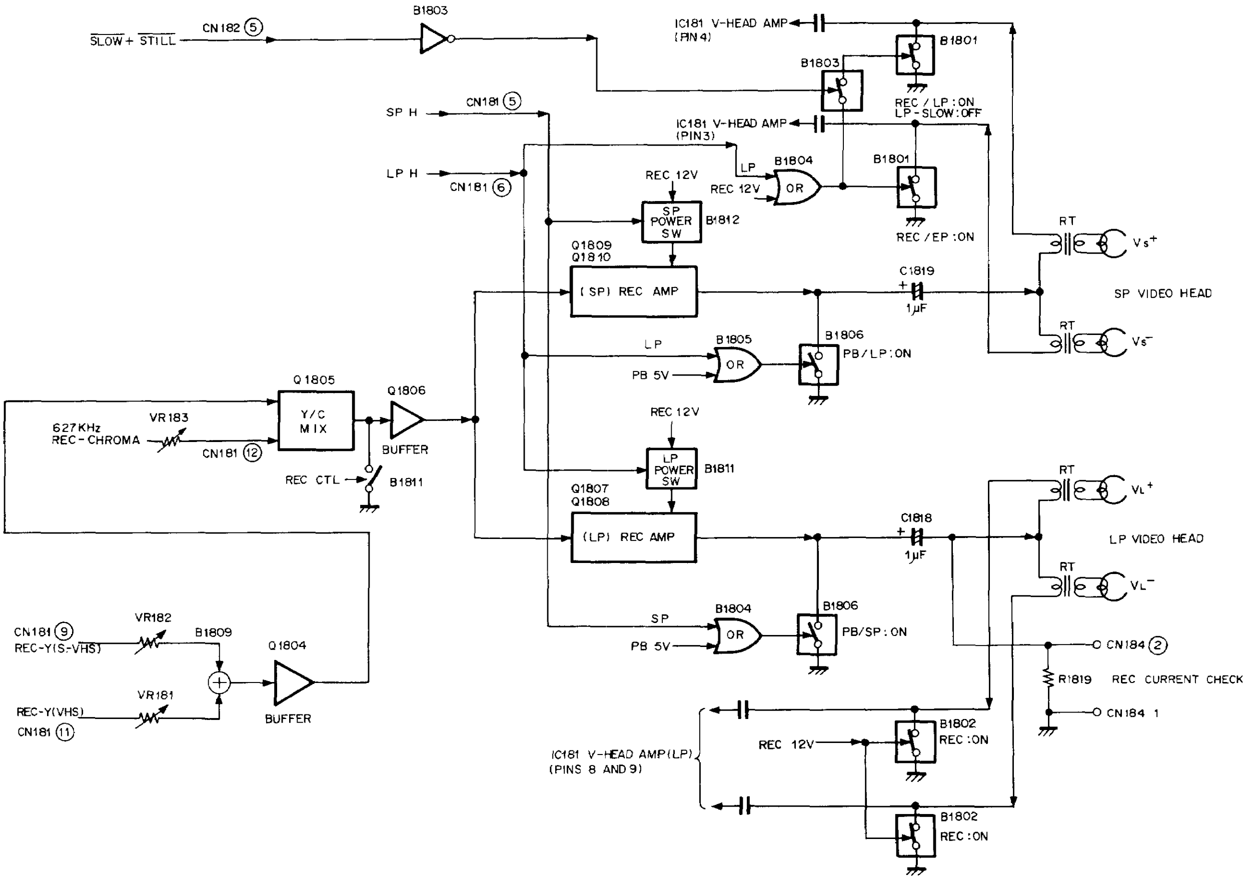
2-3. RECORDING AMPLIFIER AND VIDEO PRE-AMPLIFIER CIRCUIT

(1) Recording Amplifier

The block diagram of the recording amplifier is shown in Fig. 2-9.

The Y-FM recording signal and the chroma recording signal low-band converted to 627 kHz are mixed by Q1805, and supplied to the recording amplifier for the SP head and the recording amplifier for the LP head, through the Q1806 buffer.

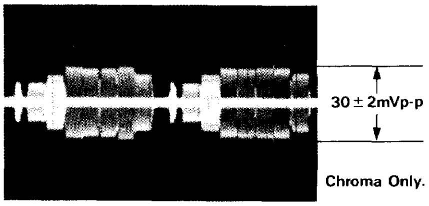
In the SP mode, the B1812 power supply circuit is activated by the SP H signal, the push-pull amplifier formed by Q1809 and Q1810 operates, and recording current is supplied to both the Vs+ and Vs− heads through the C1819 DC current cut capacitor. During recording, the Vs+ and Vs− heads are grounded by the B1801 Tr switch to form a closed circuit. During recording in the LP mode, the same operation as for the SP mode is performed.



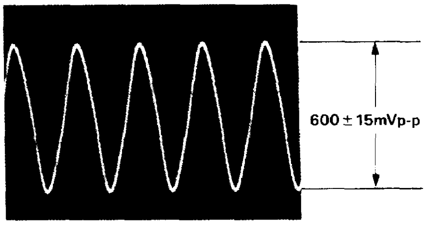
SLOW + STILL
CN182 ⑤
B1803
IC181 V-HEAD AMP (PIN4)
B1801
B1803
REC / LP : ON
LP - SLOW : OFF
SP H
CN181 ⑤
IC181 V-HEAD AMP (PIN3)
LP H
CN181 ⑥
REC 12V
LP
B1804
REC 12V
OR
B1801
SP POWER SW
B1812
REC / EP : ON
RT
Vs+
Q1809
Q1810
(SP) REC AMP
C1819
1μF
SP VIDEO HEAD
RT
Vs−
LP
B1805
OR
B1806
PB/LP : ON
PB 5V
Q1805
Q1806
627KHz REC-CHROMA
VR183
Y/C MIX
CN181 ⑫
BUFFER
REC CTL
B1811
REC 12V
LP POWER SW
B1811
Q1807
Q1808
RT
VL+
C1818
(LP) REC AMP
1μF
LP VIDEO HEAD
RT
VL−
CN181 ⑨
REC-Y(S-VHS)
VR182
B1809
Q1804
SP
B1804
OR
B1806
PB/SP : ON
PB 5V
CN184 ②
R1819
REC CURRENT CHECK
REC-Y(VHS)
VR181
CN181 ⑪
BUFFER
CN184 1
B1802
REC : ON
REC 12V
IC181 V-HEAD AMP(LP) (PINS 8 AND 9)
B1802
REC : ON

Fig. 2-9 Recording amplifier circuit

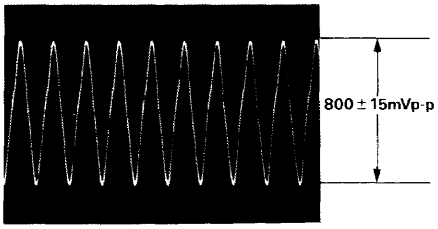
CN184 Pin 2 (VP-1) LPREC mode
(VR183 Chroma Rec. Current Adj.)



VHS LP REC mode
(VR181 Y-Rec Current Adj.)



S·VHS LP REC mode
(VR182 Y-Rec. Current Adj.)



(2) Video Pre-Amplifier Circuit

The block diagram of the playback video head amplifier circuit and video head position diagram are shown in Fig. 2-10.

The Vs and VL video head playback signals are supplied to the head pre-amplifier (IC181) through the rotary transformer (R.T.) mounted inside the head drum. During playback, the common terminal for the SP (Vs) head is grounded by the Tr switch (B1806) by switching the PB signal ON. The LP (VL) is grounded by B1806. As the level of the head playback signal to the SP head is high in comparison with the LP playback signal, interference may occur during LP playback. Interference is prevented during LP playback by using the Tr switch (B1801) to ground the SP head playback signal line. As the Vs + head plays the role of an auxiliary head for LP mode special playback, the grounding described above is released by B1804 to allow use of the head.

The Vs and VL playback signals are amplified to approximately 55 dB by the pre-amplifier located within IC181. Following this, the head playback envelope waveform is produced by Vs 180° symmetrical head switching, VL 180° symmetrical head switching, and the head amplifier switch circuit which selects use of the Vs or VL head. These switching are performed by the RF switch pulse input to Pin 1 and the head amplifier switch signal input to Pin 11. As shown in the diagram, the SP head is selected when Pin 11 is low and the LP head when high. For the low/high signal of the RF switching pulse, ± head selection is opposite for SP/LP as the SP/LP heads are positioned 180° opposite.

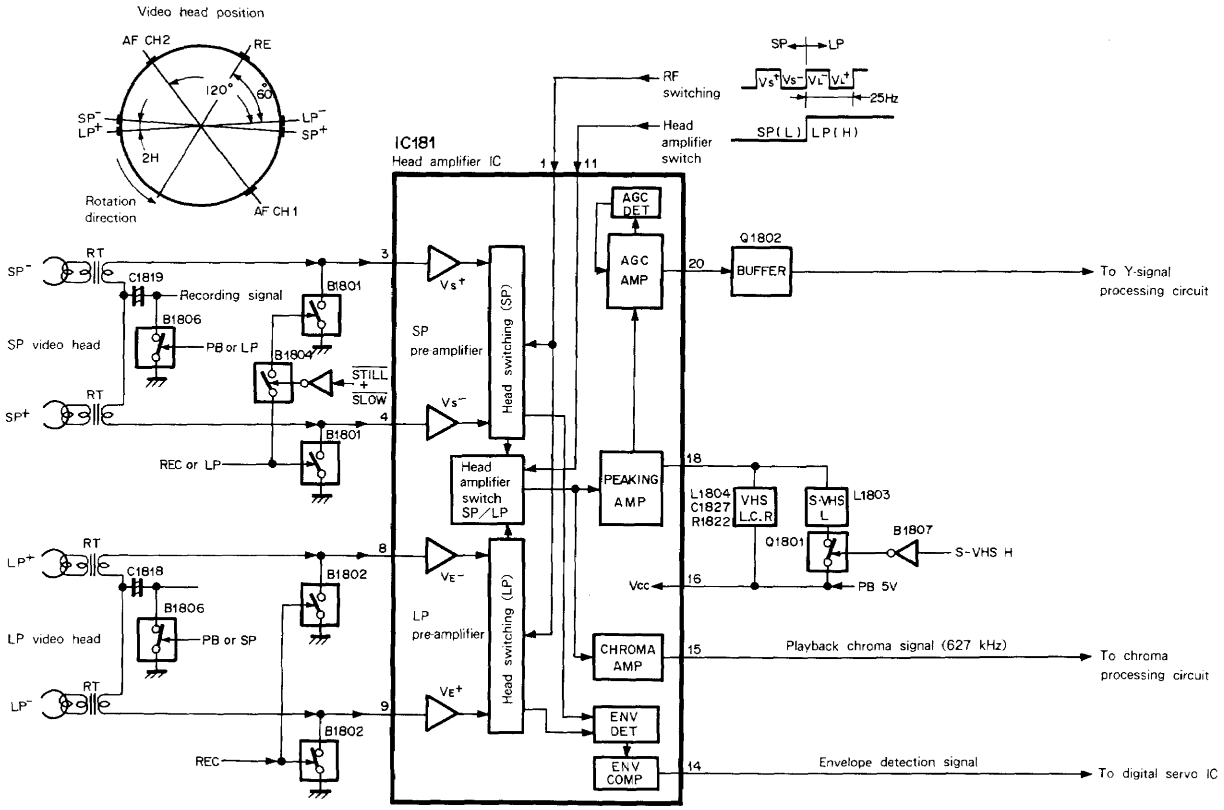
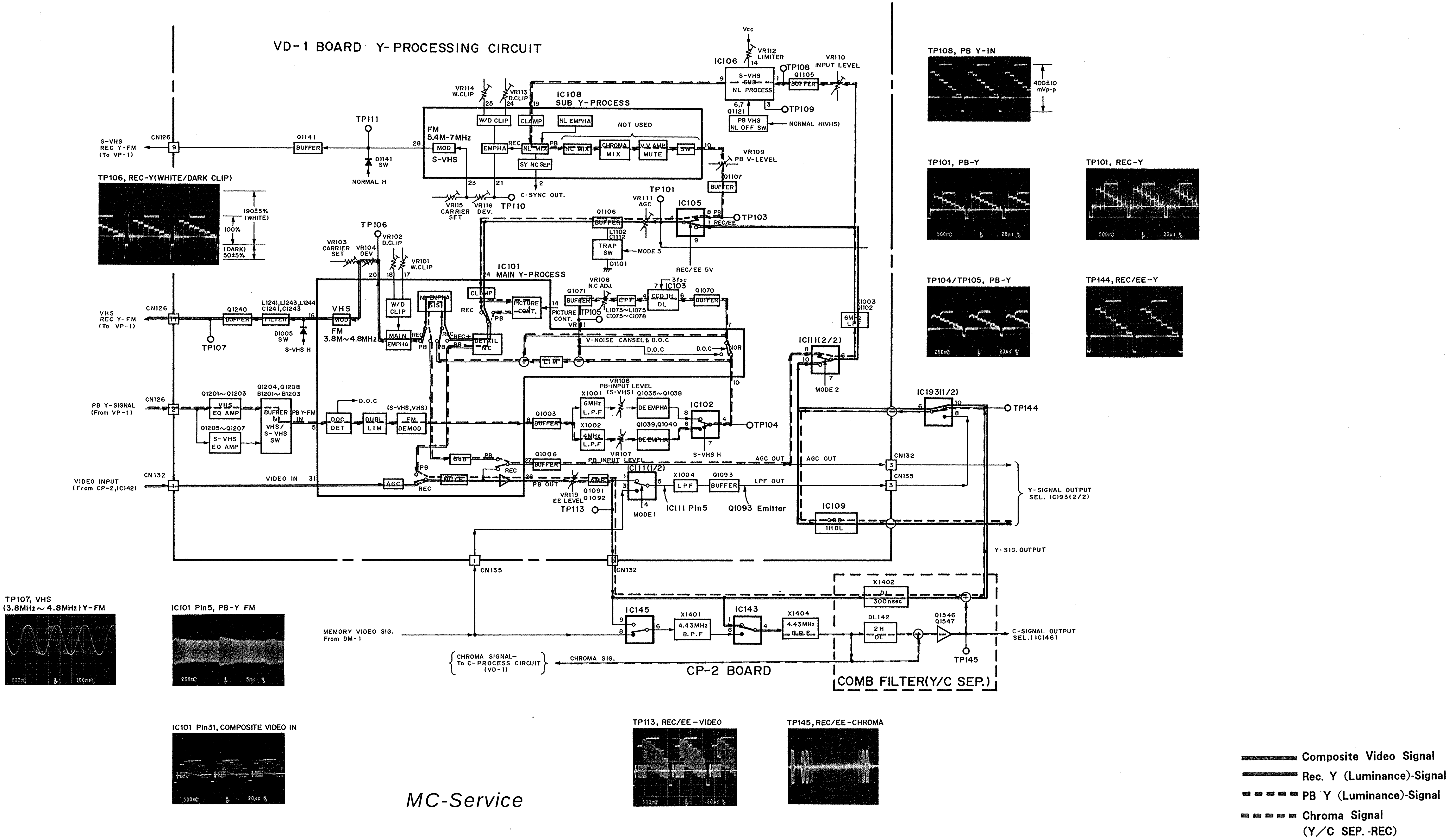

Video head position
AF CH2
RE
120°
60
SP⁻
LP⁺
LP⁻
SP⁺
2H
Rotation direction
AF CH1
SP
LP
Vs⁺
Vs⁻
VL⁻
VL⁺
25Hz
SP(L)
LP(H)
RF switching
Head amplifier switch
IC181
Head amplifier IC
1
11
AGC DET
AGC AMP
20
Q1802
BUFFER
To Y-signal processing circuit
RT
C1819
Recording signal
B1801
B1806
SP video head
PB or LP
B1804
STILL + SLOW
3
4
Vs⁺
Vs⁻
SP pre-amplifier
Head switching (SP)
REC or LP
Head amplifier switch SP/LP
PEAKING AMP
18
L1804
C1827
R1822
VHS L.C.R
S-VHS L
L1803
B1807
Q1801
S-VHS H
Vcc
16
PB 5V
C1818
B1802
8
9
VE⁻
VE⁺
LP video head
PB or SP
LP pre-amplifier
Head switching (LP)
CHROMA AMP
15
Playback chroma signal (627 kHz)
To chroma processing circuit
ENV DET
ENV COMP
14
Envelope detection signal
To digital servo IC
REC
LP⁺
LP⁻

Fig. 2-10 Video Pre-Amplifier Circuit

2-4. VHS LUMINANCE (Y) SIGNAL PROCESSING CIRCUIT

Fig. 2-11. shows the block diagram of the Y signal processing system and the VHS Y signal processing path when a composite video signal is input. A high-performance noise canceller circuit is added to the playback system, and dropout compensation is performed at the same time.



VD-1 BOARD Y-PROCESSING CIRCUIT
S-VHS REC Y-FM (To VP-1)
CN126
9
Q1141
BUFFER
TP111
D1141 SW
NORMAL H
28
FM 5.4M-7MHz
MOD
S-VHS
VR114 W.CLIP
VR113 D.CLIP
25
24
19
IC108 SUB Y-PROCESS
W/D CLIP
CLAMP
NL EMPHA
NOT USED
EMPHA
REC
NL MIX
PB
NC MIX
CHROMA MIX
V.V AMP MUTE
SW
SY NC SEP
23
21
2
C-SYNC OUT.
VR115 CARRIER SET
VR116 DEV.
TP110
Vcc
VR112 LIMITER
IC106
14
S-VHS SUB NL PROCESS
TP108
Q1105
BUFFER
VR110 INPUT LEVEL
6,7
Q1121
PB VHS NL OFF SW
3
TP109
NORMAL H(VHS)
VR109 PB V-LEVEL
Q1107
BUFFER
TP101
VR111 AGC
IC105
8 PB
1 REC/EE
TP103
Q1106
BUFFER
L1102 C1112
TRAP SW
MODE 3
Q1101
REC/EE 5V
TP106, REC-Y(WHITE/DARK CLIP)
190±5% (WHITE)
100%
(DARK) 50±5%
TP106
VR102 D.CLIP
VR103 CARRIER SET
VR104 DEV
VR101 W.CLIP
20
18
17
IC101 MAIN Y-PROCESS
24
VHS REC Y-FM (To VP-1)
CN126
11
Q1240
BUFFER
L1241,L1243,L1244 C1241,C1243
FILTER
16
TP107
D1005 SW
S-VHS H
VHS MOD
FM 3.8M~4.8MHz
W/D CLIP
MAIN EMPHA
NL EMPHA SIS
CLAMP
REC
PB
PICTURE CONT.
DETAIL NC
14
PICTURE CONT. VR101
TP105
Q1071
BUFFER
VR108 N.C ADJ.
LPF
L1073~L1075 C1075~C1078
3fsc
IC103
CCD 1H DL
Q1070
BUFFER
V-NOISE CANSEL & D.O.C
D.O.C
NOR
LIM
X1003 Q1102
6MHz LPF
IC111(2/2)
MODE 2
PB Y-SIGNAL (From VP-1)
CN126
2
Q1201~Q1203
VHS EQ AMP
Q1205~Q1207
S-VHS EQ AMP
Q1204,Q1208 B1201~B1203
BUFFER & VHS/S-VHS SW
PB Y-FM IN
5
DOC DET
DUBL LIM
FM DEMOD
(S-VHS,VHS)
VR106 PB-INPUT LEVEL (S-VHS)
X1001
6MHz L.P.F
Q1035~Q1038
DE EMPHA
X1002
4MHz L.P.F
Q1039,Q1040
DE EMPHA
IC102
S-VHS H
TP104
Q1003
BUFFER
Q1006
BUFFER
VR107 PB INPUT LEVEL
SUB
MUTE
AGC
VIDEO INPUT (From CP-2,IC142)
CN132
VIDEO IN 31
27
26
PB OUT
VR119 EE LEVEL
Q1091 Q1092
AMP
TP113
IC111(1/2)
MODE1
X1004
LPF
Q1093
BUFFER
LPF OUT
IC111 Pin5
Q1093 Emitter
AGC OUT
CN132
CN135
IC109
CCD 1H DL
IC193(1/2)
TP144
Y-SIGNAL OUTPUT SEL. IC193(2/2)
Y-SIG. OUTPUT
CN135
CN132
MEMORY VIDEO SIG. From DM-1
CHROMA SIGNAL– To C-PROCESS CIRCUIT (VD-1)
CHROMA SIG.
IC145
X1401
4.43MHz B.P.F
IC143
X1404
4.43MHz B.P.F
X1402
DL 300nsec
DL142
2H DL
Q1546 Q1547
TP145
C-SIGNAL OUTPUT SEL.(IC146)
CP-2 BOARD
COMB FILTER(Y/C SEP.)
TP108, PB Y-IN
400±10 mVp-p
TP101, PB-Y
TP101, REC-Y
TP104/TP105, PB-Y
TP144, REC/EE-Y
TP107, VHS (3.8MHz~4.8MHz) Y-FM
IC101 Pin5, PB-Y FM
IC101 Pin31, COMPOSITE VIDEO IN
TP113, REC/EE-VIDEO
TP145, REC/EE-CHROMA
Composite Video Signal
Rec. Y (Luminance)-Signal
PB Y (Luminance)-Signal
Chroma Signal (Y/C SEP. -REC)

Fig. 2-11 VHS Y-signal Processing Circuit Block Diagram

(1) Recording System (Including EE)

Tuner input, composite video signals from external terminal input, or the Y-signal from S input terminals is selected by IC142 on the CP-2 board, and input to Pin 31 of the VHS Y-signal processing IC (IC101).

The input signal level of this video signal is first set to a constant level by the sync AGC circuit inside IC101. Although the degree of amplification by the AGC amplifier is set by the AGC amplifier detection (DET) output, this set value is set by the Y-signal sync level of the AGC loop input to Pin 24 through the VR (VR111) for adjustment of the AGC level. The video signal which passed through the AGC amplifier passes through the internal R/P switch, sub-clamp circuit, and VD MUTE (V-LOCK pulse inserted for special playback). The Y-signal is then split to two systems.

When a composite video signal (TUNER/EXT VIDEO IN) was input, the video signal output to Pin 26 through the internal buffer amplifier of IC101 is used. This video signal passes through the EE level adjustment VR (VR119) and amplifier (Q1091, Q1092), and is output to the CP-2 board from Pin 5 of CN132. This composite video signal is fed to the 4.43 MHz B.P.F. (X1404) by the select switch formed by Pins 1, 6, and 4 of IC143, and the chroma signal is separated. The separated chroma signal is input to the chroma recording system. The separated chroma signal and composite video signal are input to comb type filter formed around a 2H delay line (DL142) and delay line (X1402) to provide highly precise Y/C separation.

The chroma signal Y/C separated by this comb type filter forms the EE system output signal for the S terminal. On the other hand, the Y-signal is output to the Y recording system and EE system, and is thus input to the VD-1 board again through the switch formed by Pins 10, 8, and 6 of IC193.

The Y-signal is split to the recording system and EE output system at the VD-1 board. The signal to the EE system passes through the IC109 CCD 1H delay line and is sent to the CP-2 board output switching system again. The reason why the EE system signal passes through the CCD 1H delay line is that the chroma signal will be delayed in the vertical direction when Y/C is separated by the comb type filter using 2H correlation. The Y-signal is thus delayed by 1H to correct the delay in the Y/C vertical direction.

On the other hand, the Y-signal for the recording system is input to Pin 24 of IC101 for Y-signal processing through the switch formed by Pins 8, 10, and 6 of IC111, the 6 MHz Y band LPF (X1003), R/P switch (IC105), and AGC adjustment VR (VR111). IC101 performs the Y-signal recording system processing described in the next sections. This processing consists of a detail enhancer, NL-emphasis, main emphasis, white/dark clip, and FM adjustment, etc.

[Detail Enhancer]

Detail enhancement is a technology used to provide high picture quality aimed at improving the reproduction of details by enhancing during recording the portions of the signals which have a low amplitude. These minute signals which lie in the area from the mid to high ranges of the frequency characteristics are treated as noise components during FM modulation and demodulation of the video signals.

As shown in Fig. 2-12., the detail enhancer characteristics are such that the amount of emphasis increases as the minute signals of the luminance signal reach the high-band frequencies and as the signal level becomes smaller.

The Y-signal with the minute signal in the high-band emphasized by the detail enhancement circuit is input to the NL (non-linear) emphasis circuit through the R/P switch located inside the IC.

[NL-Emphasis]

The aim of the NL-emphasis circuit is to improve the S/N ratio during LP recording/playback. Thus, the NL-emphasis operation is released when standard speed (SP) is selected by the LP/SP signal input to Pin 23 through B1002 (INV.).

In the same manner as detail enhancement described above, the level is altered by NL-emphasis according to the level of the input Y-signal. The S/N ratio is improved greatly at the mid-and high-band frequencies by increasing the amount of emphasis at low levels where noise is prominent and decreasing the amount of emphasis at high levels where noise is less prominent. The NL-emphasis characteristics are shown in Fig. 2-13. These characteristics are set by the C.R. externally attached to Pin 22.

The Y-signal is input to the main emphasis circuit after passing through the NL-emphasis circuit.

Detail Enhancer Characteristics

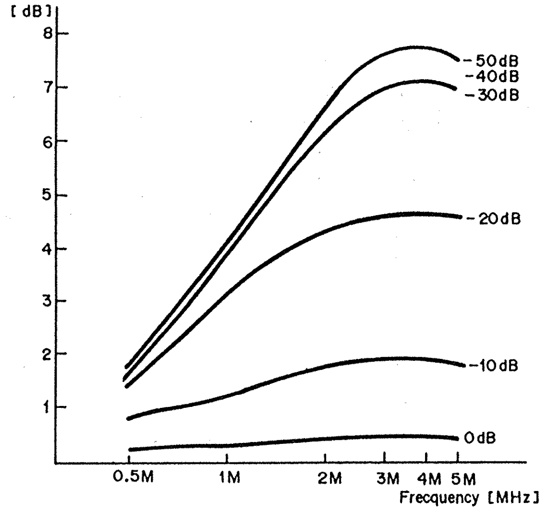


Fig. 2-12.

NL-Emphasis Characteristics

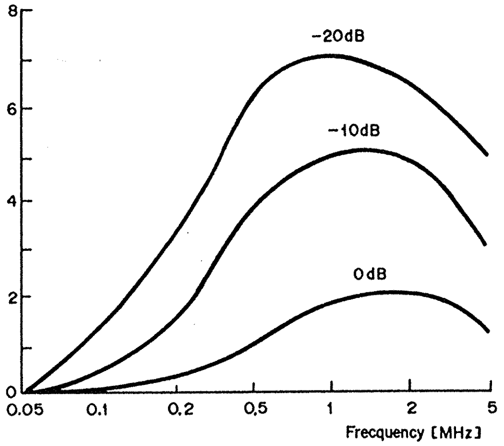


Fig. 2-13.

[Main Emphasis]

The main emphasis circuit has the fixed emphasis characteristics shown in Fig. 2-14. operating proportional to only the frequency. This is the basic emphasis used in VHS systems.

When the FM modulated Y-signal is demodulated, the output level is low at frequencies close to the carrier frequency, and as the frequency becomes farther away from the carrier frequency, the output level increases proportional to the frequency deviation (Δ f). According to these characteristics, the amount of noise will increase in demodulated high-band frequency components. Taking this property into consideration, main emphasis is used to improve the S/N ratio of the FM demodulation signal.

As shown in Fig. 2-14., the high-band components are enhanced by passing the signal through the main emphasis (pre-emphasis) circuit.

Next, the Y-signal which passed through the pre-emphasis circuit is FM modulated and recorded on the tape. During playback, this signal is FM demodulated and the original signal is restored by a de-emphasis circuit having the opposite characteristics of the pre-emphasis circuit used after demodulation. At this time, the already enhanced high-band components of the Y-signal are returned to their original level and the S/N ratio is improved by suppressing the noise components at only the high-band frequencies.

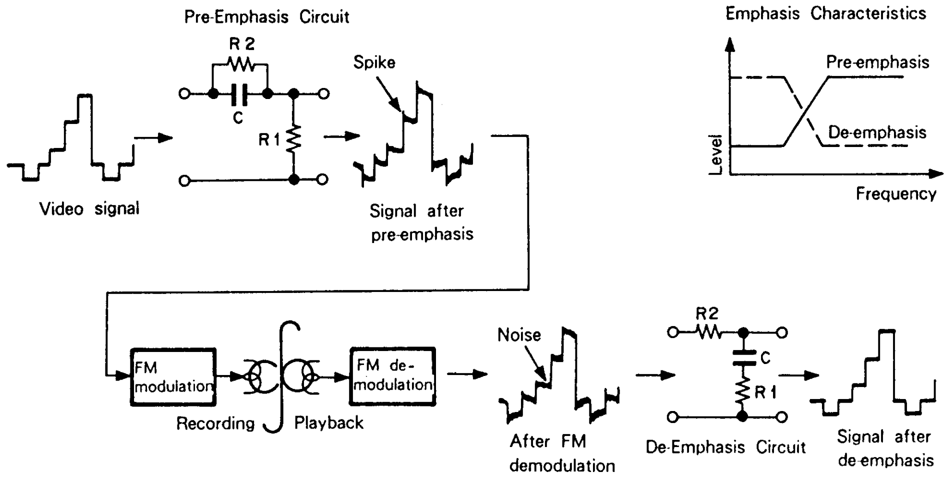
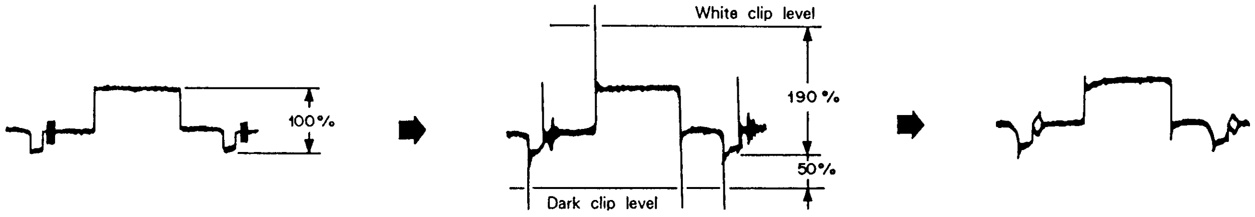

Pre-Emphasis Circuit
R 2
C
R 1
Spike
Video signal
Signal after pre-emphasis
Emphasis Characteristics
Pre-emphasis
De-emphasis
Level
Frequency
FM modulation
FM de-modulation
Recording
Playback
Noise
After FM demodulation
R2
C
R 1
De-Emphasis Circuit
Signal after de-emphasis

Fig. 2-14. Main Emphasis Operation

The over-shoot and under-shoot spike noise shown in Fig. 2-15. (b) are produced in the Y-signal which had its high-band frequencies enhanced by the emphasis circuit. If the signal is FM modulated in this state, overmodulation will occur at the spike noise sections, and picture quality will be affected by inversion phenomena during playback.


a) Input video signal

b) Y-signal after emphasis

c) Playback video signal

100%
White clip level
190%
50%
Dark clip level

Fig. 2-15.

[White Clip, Dark Clip Circuit]

The tips of the spike signal occurring in the Y-signal, in order to prevent overmodulation during FM modulation, are reduced the levels to the VHS specification values in the clip (white and dark) circuits.

White clipping has been increased from the 160% used with conventional VHS to 190%. This is because inversion phenomena are less likely to occur even with a certain increase in the amount of emphasis due to improved performance by video heads and video tape and advances in video circuit technology in the VHS-HQ system. Adjustment is by the following components :

- VR102 (D.CLIP) :
  Dark clipping is 50% from the sync tips
- VR101 (W.CLIP) :
  White clipping is 190% from the sync tips

(W/D clipping is with the white peak as 100% from the sync tips)

The D/W clipping processed Y-signal is input to the frequency modulator (FM) having the characteristics shown in Fig. 2-16. Adjustment of the sync tip frequency (carrier) and modulation degree (frequency deviation) is performed by the following components :

- VR103 (CARRIER SET) :
  Sync tip frequency adjusted to 3.8 MHz ± 0.03MHz
- VR104 (DEV.) :
  Frequency deviation adjusted to 1.0 MHz ± 0.03 MHz

The FM modulated Y-signal is input to the recording amplifier on the VP-1 board through Pin 11 of CN126.

Frequency Modulation (FM) Characteristics

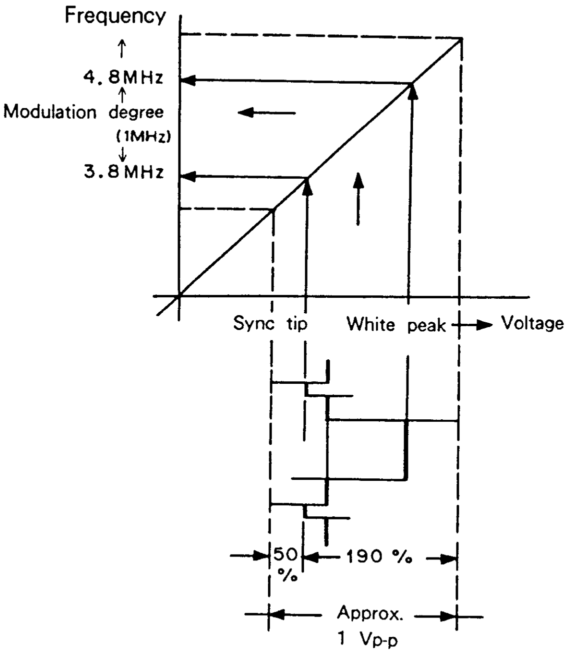


Fig. 2-16.

(2) Playback System

The video head playback signal (Y-FM) is amplified by the VP-1 pre-amplifier circuit, is input to the S-VHS EQ amplifier and VHS EQ amplifier through the CN126 Pin 2 connector on the VD-1 board, and is amplified to approximately 1 Vp-p. In the VHS mode , the amplifier has peaking amplifier characteristics and overall characteristics with peaking at approximately 4 MHz by the VHS EQ amplifier. In the S-VHS mode, the characteristics are changed by the Tr switch (Q1801 and B1807 on VP-1 board) and S-VHS peaking L.C.R., providing overall characteristics for the S-VHS EQ amplifier which are flat to approximately 6 MHz.

The Y-FM signal input to the VHS luminance signal processing IC (IC101) is input to the detection circuit (DOC. DET.) for dropout compensation, and is then input to the limiter circuit.

The limiter circuit eliminates Y-FM signal level fluctuations occurring during playback, and supplies the signal to the FM demodulation circuit at a fixed level. This prevents deterioration of the S/N ratio during demodulation.

The FM demodulation circuit includes an input limiter circuit and a L.P.F.circuit which eliminates high-band frequency components above the carrier components.

X1002 of L.P.F. eliminates the high-band frequency components not needed for the VHS system (those above 3.2 MHz) from the demodulation Y-signal output from Pin 8 of IC101, and the resulting signal is input to the de-emphasis circuit for main emphasis.

The de-emphasis circuit is formed by a C.R. and L.C.R. attached to the emitter and collector of Q1039, and is set to the characteristics shown in Fig. 2-14. above. In the LP mode, the de-emphasis characteristics are changed by B1037.

The Y-signal which passed through the de-emphasis circuit passes through switch IC102 and is input to Pin 10 of IC101. The internal circuitry of this IC consists of a noise canceller and dropout compensation circuit.

The NL-emphasis circuit for playback operates only in the LP mode as an NL de-emphasis circuit with the opposite characteristics of those shown in Fig. 2-13. After the S/N ratio is improved (LP mode) by the NL-emphasis circuit, the signal passes through a 6dB amplifier and the Y-signal is output from Pin 27. The Y-signal output from Pin 27 passes through the X1003 6 MHz L.P.F. via the IC111 switch, and is input to the IC106 S-VHS SUB NL-emphasis circuit after passing through the Q1102 buffer amplifier.

In the VHS mode, the NL-emphasis operation of IC106 is released by the NORMAL H signal and Q1121. In other words, IC106 only plays the role of a buffer in the VHS mode.

Although the Y-signal is next input to Pin 19 of IC108, it simply passes though this IC and is output to Pin 10, not using the NL mix and chroma mix circuits, etc.

The Y-signal is input to IC101 again via the IC105 R/P switch. After the Y-signal input to Pin 24 is clamped, it is input to the picture control circuit. The picture control circuit is a picture quality adjustment circuit using a quadratic differentiation method. The picture quality of the high-band components is adjusted by the DC potential input to Pin 14. After adjustment of the picture quality, the signal is input to the detail enhancer through the R/P switch.

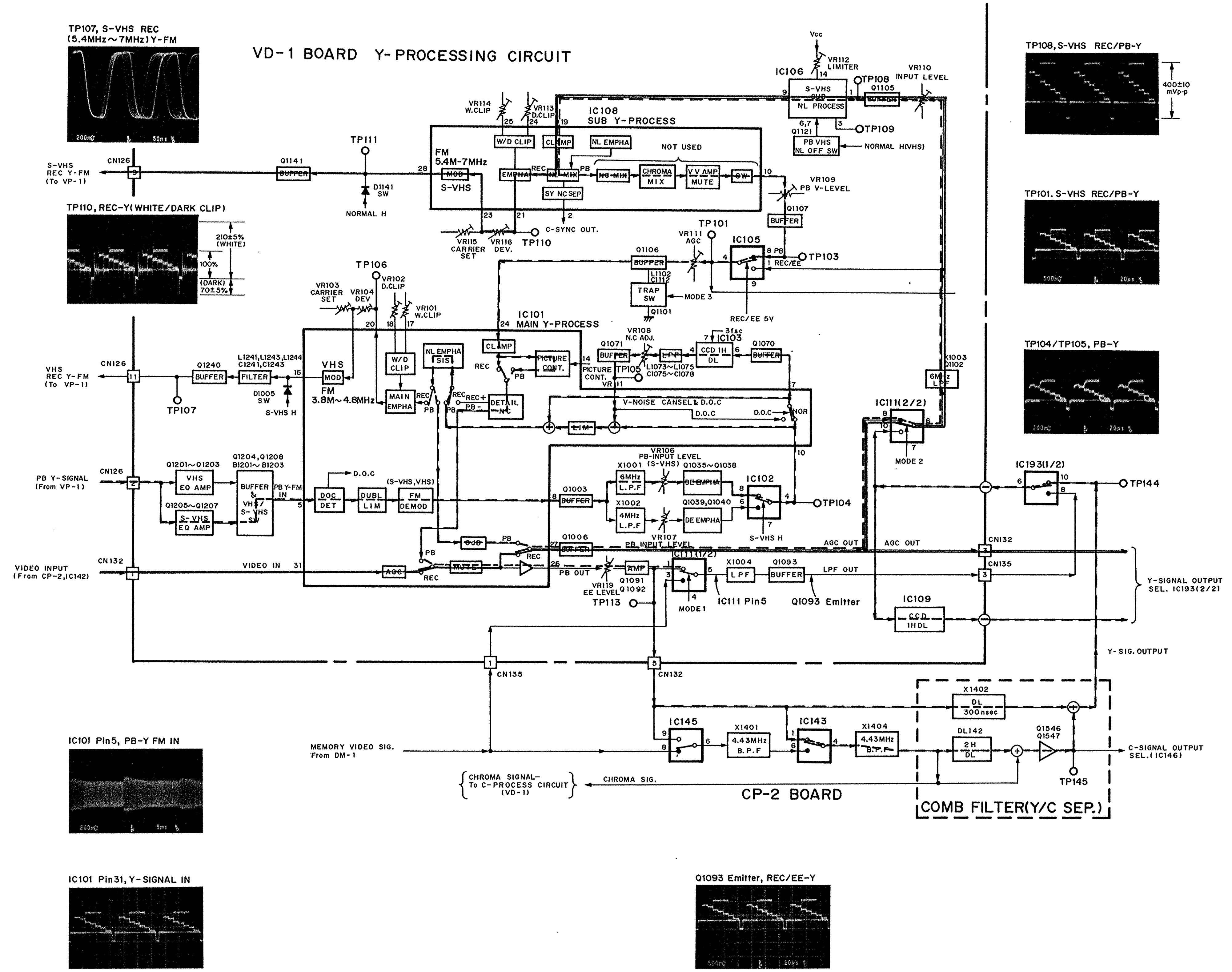
The detail enhancement circuit for playback functions as a canceller circuit for the noise contained in the high-band frequency components. The internal limiter circuit is controlled (adjusted to low level) and opposite characteristics are output from the − terminal as shown in Fig. 2-12.

However in the S-VHS and EDIT modes, the B1001 switch at Pin 15 lowers the noise canceller level. After the Y-signal passes through the noise canceller, it is output from Pin 26 of IC101 via the R/P switch, VD MUTE (inserts V-LOCK pulse for special playback), and the buffer amplifier. This path and the output path with follows are the same as the EE mode, and the output is to the LINE OUT output by the S output terminal and Y/C mix signal and to the RF converter.

MEMO

2-5. S-VHS LUMINANCE (Y) SIGNAL PROCESSING CIRCUIT

Fig. 2-17. shows the block diagram of the Y-signal processing circuit and the S-VHS Y-signal processing path when there is S terminal input.



TP107, S-VHS REC (5.4MHz~7MHz) Y-FM
TP110, REC-Y(WHITE/DARK CLIP)
210±5% (WHITE)
100%
(DARK) 70±5%
IC101 Pin5, PB-Y FM IN
IC101 Pin31, Y-SIGNAL IN
Q1093 Emitter, REC/EE-Y
TP108, S-VHS REC/PB-Y
400±10 mVp-p
TP101, S-VHS REC/PB-Y
TP104/TP105, PB-Y
VD-1 BOARD Y-PROCESSING CIRCUIT
S-VHS REC Y-FM (To VP-1)
CN126
Q1141
BUFFER
TP111
D1141 SW
NORMAL H
FM 5.4M-7MHz
MOD
S-VHS
VR114 W.CLIP
VR113 D.CLIP
IC108 SUB Y-PROCESS
W/D CLIP
CLAMP
NL EMPHA
NOT USED
EMPHA
NL MIX
NC MIX
CHROMA MIX
V.V AMP MUTE
SW
SY NC SEP
C-SYNC OUT.
VR115 CARRIER SET
VR116 DEV.
TP110
Vcc
VR112 LIMITER
IC106
S-VHS SUB NL PROCESS
TP108
Q1105
BUFFER
VR110 INPUT LEVEL
Q1121
TP109
PB VHS NL OFF SW
NORMAL H(VHS)
VR109 PB V-LEVEL
Q1107
BUFFER
TP101
VR111 AGC
IC105
REC/EE
TP103
Q1106
BUFFER
L1102 C1112
TRAP SW
MODE 3
Q1101
REC/EE 5V
TP106
VR102 D.CLIP
VR103 CARRIER SET
VR104 DEV
VR101 W.CLIP
IC101 MAIN Y-PROCESS
VHS REC Y-FM (To VP-1)
Q1240
BUFFER
L1241,L1243,L1244 C1241,C1243
FILTER
D1005 SW
S-VHS H
TP107
VHS MOD
FM 3.8M~4.8MHz
W/D CLIP
NL EMPHA SIS
MAIN EMPHA
CLAMP
PICTURE CONT.
DETAIL NC
REC+PB-
VR108 N.C ADJ.
Q1071
BUFFER
LPF
CCD 1H DL
3fsc IC103
Q1070
BUFFER
PICTURE CONT. VR
TP105
L1073~L1075 C1075~C1078
X1003 Q1102
6MHz LPF
V-NOISE CANSEL & D.O.C
D.O.C
NOR
LIM
IC111(2/2)
MODE 2
PB Y-SIGNAL (From VP-1)
Q1201~Q1203
VHS EQ AMP
Q1205~Q1207
S-VHS EQ AMP
Q1204,Q1208 B1201~B1203
BUFFER & VHS/S-VHS SW
PB Y-FM IN
D.O.C
DOC DET
DUBL LIM
FM DEMOD
(S-VHS,VHS)
VR106 PB-INPUT LEVEL (S-VHS)
X1001
6MHz L.P.F
Q1035~Q1038
DE EMPHA
IC102
Q1003
BUFFER
X1002
4MHz L.P.F
Q1039,Q1040
DE EMPHA
TP104
S-VHS H
VR107 PB INPUT LEVEL
Q1006
BUFFER
AGC OUT
IC193(1/2)
TP144
CN132
CN135
VIDEO INPUT (From CP-2,IC142)
VIDEO IN
AGC
MUTE
SUB
PB
REC
PB OUT
AMP
VR119 EE LEVEL
Q1091 Q1092
TP113
IC111(1/2)
MODE1
X1004
LPF
Q1093
BUFFER
LPF OUT
IC111 Pin5
Q1093 Emitter
IC109
CCD 1H DL
Y-SIGNAL OUTPUT SEL. IC193(2/2)
Y-SIG. OUTPUT
CN135
CN132
X1402
DL 300nsec
IC145
X1401
4.43MHz B.P.F
IC143
X1404
4.43MHz B.P.F
DL142
2H DL
Q1546 Q1547
TP145
C-SIGNAL OUTPUT SEL.(IC146)
MEMORY VIDEO SIG. From DM-1
CHROMA SIGNAL- To C-PROCESS CIRCUIT (VD-1)
CHROMA SIG.
CP-2 BOARD
COMB FILTER(Y/C SEP.)

Luminance (Y) Processing Signal Flows

▬▬▬▬ REC Mode

▬ ▬ ▬ ▬ PB Mode

Fig. 2-17. S-VHS Y-Signal Processing Block Diagram

This circuit which is different from the VHS Y-signal processing circuit described in the previous section has the following characteristics.

1) The EE system including the input AGC circuit shares the VHS circuit.
2) A S-VHS non-linear emphasis circuit (IC106) for improving the S/N ratio in the high ranges is used.
3) White/dark clipping increased
    - White clipping : 210%
    - Dark clipping : 70%
4) Changes in FM modulation / demodulation characteristics
    - Sync tip frequency : 5.4 MHz
    - White peak frequency : 7 MHz
5) Circuits for Y-signal noise canceller and dropout compensation during playback share the VHS circuit described above.
6) S-VHS/VHS discrimination circuit (IC110) is included.

(1) Recording System

The Y-signal input from the S input terminal or tuner system passes through the EE system (AGC circuit, etc.) of the VHS Y-signal processing circuit (IC101 on VD-1 board) and is input to the S-VHS Y-signal processing circuit. After the Y-signal passes through the IC111 switch, it is corrected to the band needed for S-VHS by the X1003 6 MHz L.P.F., and is then input to the IC106 S-VHS sub-emphasis circuit.

The S-VHS sub non-linear emphasis is the same as the NL-emphasis shown in Fig. 2-13. above, and has emphasis characteristics corresponding to the frequency and input level. However, the internal characteristics cannot be indicated due to VHS group policies. The following adjustment items are important for stabilizing the operating characteristics /performance of S-VHS sub NL-emphasis.

1) NL-emphasis input level
    (IC106 Pin 1 : TP108)
    Adjusted to 400 mVp-p by VR110 using colour bar signal input.
2) Power voltage to NL-emphasis IC
    (IC106 Pin 8 : TP131)
    Adjusted to 5.00 ± 0.02V (DC) by VR141.
3) NL-emphasis internal limiter voltage
    (IC106 Pin 3 : TP109)
    Adjusted to 3.48 ± 0.02V (DC) by VR112.

After NL-emphasis of the Y-signal, it is input to Pin 19 of IC108. After clamping by IC108, the signal is input to the same main emphasis circuit (Fig. 2-14.) used for VHS. In the same manner as VHS, white/dark clipping to prevent overmodulation caused by overshooting and undershooting after emphasis is performed by the HQ with a wider range than that achieved by the HQ system. (Fig. 2-18.)

S-VHS White Clipping/Dark Clipping

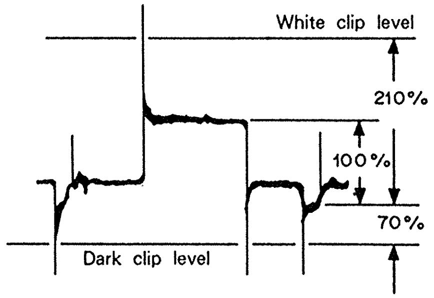


Fig. 2-18 (TP110)

[Dark Clipping, White Clipping Adjustment]

- VR113 (D. CLIP) : Dark clipping performed 70% from the sync tips.
- VR114 (W. CLIP) : White clipping performed 210% from the sync tips.
  (This clipping is with the white peak as 100% from the sync tips)

The D/W clipping processed Y-signal is input to the frequency modulator having the characteristics shown in Fig. 2-19. Adjustment of the sync tip frequency (carrier) and degree of modulation is performed in the following manner.

- VR115 (CARRIER SET) : Sync tip frequency adjusted to 5.4 ± 0.02 MHz (no signal input).
- VR116 (DEV.) : Frequency deviation adjusted to 1.6 MHz.
  Actual adjustment is made according to the reference tape playback level and self-recording/playback level.

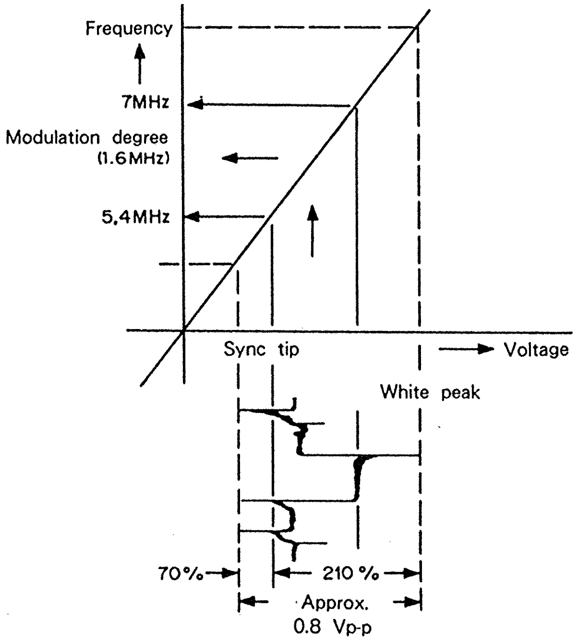


Fig. 2-19. Modulation Characteristics

The FM wave of the Y-signal is output from Pin 28 of IC108. The recording current used for S-VHS recording is higher than for the VHS system as tape with high magnetic resistance is used.

[Recording Current Adjustment (LP Mode)]

- S-VHS (SVR182) : 800 mVp-p
- VHS (SVR181) : 600 mVp-p
  (The recording current is measured by the voltage at both ends of R1819 (VP-1 board) during LP mode.)
  The S-VHS FM wave is output from Pin 9 of CN126 and is output to the video head recording amplifier (VP-1 board).

(2) Playback System

The video head playback signal (Y-FM) is amplified by the pre-amplifier circuit on the VP-1 board, and is input to Pin 5 of IC101 via the Pin 2 connector of CN126 on the VD-1 board.

The Y-FM signal input to IC101 is input to the detection circuit (DOC . DET) for dropout compensation. In the DOC detection stage, the Y-FM (envelope) signal is first AM detected and the D. O. pulse having the hysteresis effects shown in Fig. 2-20. is output. This D.O. pulse is input to the noise canceller and D.O. compensation circuit, and is used for the Y-FM defect compensation during D.O.

The Y-FM signal is input to the limiter circuit through the L.P.F.

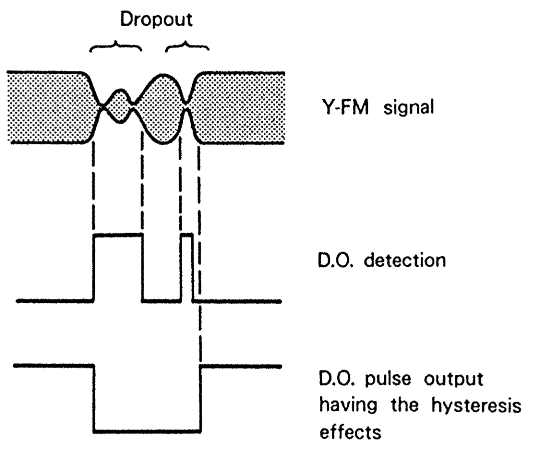


Fig. 2-20. DOC Detection

In the limiter circuit, fluctuations in the Y-FM signal level occurring during playback are eliminated and the signal is supplied to the FM demodulation circuit at a fixed level to prevent deterioration in the S/N ratio during demodulation.

The FM demodulation circuit (DE-MOD) has a circuit configuration consisting of an input limiter circuit and an L.P.F. circuit to eliminate high-range components above the carrier component.

In this model, the level of the S-VHS NL-emphasis input (TP108) during playback is set to 400 mVp-p, the same used for recording.

The demodulated Y-signal is output from Pin 8 and is input to the de-emphasis circuit after high-band frequency components above 6 MHz, those not needed for the S-VHS system, are eliminated at the L.P.F. of X1001.

The de-emphasis circuit produces the de-emphasis characteristics for main emphasis by the C.R. of Q1035 corrector formed by C1039, C1038, and R1039.

The Y-signal which passed through the de-emphasis circuit is input to Pin 10 of IC101 through the IC102 VHS/S-VHS switch. The Y-signal is output to Pin 27 through the internal Y noise canceller, D.O compensation circuit, and NL-emphasis circuit. This is the same as the VHS mode. The Y-signal output from Pin 27 of IC101 is input to the S-VHS NL-emphasis circuit (IC106) through IC111 and the 6 MHz B.P.F. (X1003).

During playback, IC106 performs S-VHS NL de-emphasis operation and the Y-signal is output from Pin 9 in the same manner as recording.

The Y-signal which passed through the NL de-emphasis stage is output to the same path as the VHS playback system (Fig. 2-11.).

It is then output to the S output terminal, LINE OUT, and RF converter.

2-6. CHROMA SIGNAL PROCESSING CIRCUIT

The basic operations for chroma signal processing have not been altered from the conventional VHS system. Fig. 2-21. shows the block diagram for the chroma signal processing circuit and the chroma processing paths for the recording system and playback system.

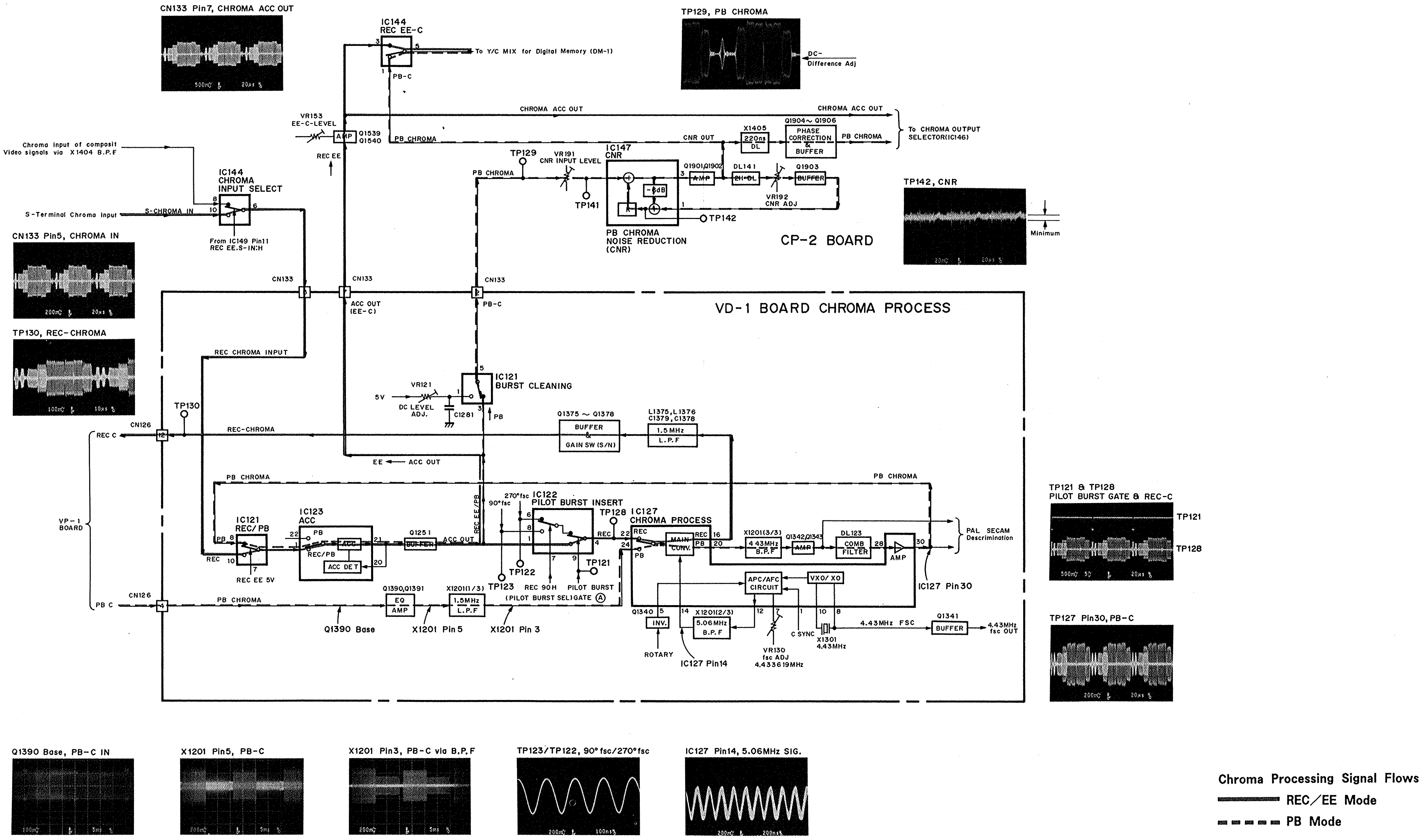

CN133 Pin7, CHROMA ACC OUT
IC144
REC EE-C
PB-C
To Y/C MIX for Digital Memory (DM-1)
TP129, PB CHROMA
DC-
Difference Adj
CHROMA ACC OUT
VR153
EE-C-LEVEL
AMP
Q1539
Q1540
REC EE
PB CHROMA
CNR OUT
X1405
220ns
DL
Q1904～Q1906
PHASE CORRECTION & BUFFER
PB CHROMA
To CHROMA OUTPUT SELECTOR(IC146)
Chroma input of composit Video signals via X1404 B.P.F
IC144
CHROMA
INPUT SELECT
S-Terminal Chroma Input
S-CHROMA IN
From IC149 Pin11
REC EE.S-IN:H
TP129
VR191
CNR INPUT LEVEL
IC147
CNR
-6dB
TP141
Q1901,Q1902
AMP
DL141
2H-DL
Q1903
BUFFER
VR192
CNR ADJ
TP142
PB CHROMA
NOISE REDUCTION
(CNR)
CP-2 BOARD
TP142, CNR
Minimum
CN133 Pin5, CHROMA IN
CN133
ACC OUT
(EE-C)
PB-C
VD-1 BOARD CHROMA PROCESS
TP130, REC-CHROMA
REC CHROMA INPUT
IC121
BURST CLEANING
5V
VR121
DC LEVEL ADJ.
C1281
PB
TP130
CN126
REC C
REC-CHROMA
Q1375～Q1378
BUFFER & GAIN SW (S/N)
L1375,L1376
C1379,C1378
1.5MHz
L.P.F
EE ← ACC OUT
PB CHROMA
VP-1 BOARD
IC121
REC/PB
REC
REC EE 5V
IC123
ACC
REC/PB
ACC DET
Q1251
BUFFER
ACC OUT
REC EE/PB
270°fsc
90°fsc
IC122
PILOT BURST INSERT
TP122
TP123
REC 90H
PILOT BURST
(PILOT BURST SEL)GATE Ⓐ
TP121
TP128
IC127
CHROMA PROCESS
MAIN CONV.
X1201(3/3)
4.43MHz
B.P.F
Q1342,Q1343
AMP
DL123
COMB FILTER
AMP
PAL SECAM Descrimination
IC127 Pin30
APC/AFC CIRCUIT
VXO/XO
Q1340
INV.
ROTARY
X1201(2/3)
5.06MHz
B.P.F
IC127 Pin14
VR130
fsc ADJ
4.433619MHz
C SYNC
X1301
4.43MHz
4.43MHz FSC
Q1341
BUFFER
4.43MHz fsc OUT
PB C
PB CHROMA
Q1390,Q1391
EQ AMP
X1201(1/3)
1.5MHz
L.P.F
Q1390 Base
X1201 Pin5
X1201 Pin 3
TP121 & TP128
PILOT BURST GATE & REC-C
TP127 Pin30, PB-C
Q1390 Base, PB-C IN
X1201 Pin5, PB-C
X1201 Pin3, PB-C via B.P.F
TP123/TP122, 90° fsc/270° fsc
IC127 Pin14, 5.06MHz SIG.
Chroma Processing Signal Flows
REC/EE Mode
PB Mode

Fig. 2-21. Chroma Processing Block Diagram

(1) Recording System (Fig. 2-21. and Fig. 2-22.)

The chroma signal is input to Pin 1 of the chroma signal ACC (IC123) through the S terminal input and EXT/TUNER input select switch IC144 and the REC/PB input select switch IC121. The EXT and TUNER chroma signals pass through the AGC circuit (IC101) for the luminance system (Y), and are input to the IC144 select switch described above after the chroma component has been extracted by the X1404 4.43 MHz B.P.F.

In the IC123 ACC circuit, the ACC amplifier gain for the chroma signal is controlled by the control signal from the ACC DET so that the level of the chroma signal is kept constant in reference to the burst signal of the input chroma signal, and is then output from Pin 21.

(IC123 is only used in the ACC circuit.)

After the level of the chroma signal is made constant by the ACC circuit, it passes through the Q1251 buffer, and is split and supplied to the E-E system and recording system.

[E-E System Chroma Signal]

After the chroma level of the E-E system chroma signal is adjusted by the VR153 of the chroma amplifier formed by Q1539 and Q1540, the signal is selected by the selector circuit (CP-2) for the S-terminal and Y/C mix signal output, and is output to the monitor from the output terminals.

[Recording Chroma Signal]

The pilot burst signal is first inserted into the chroma signal for the recording system according to the S-VHS specifications by IC122. Refer to Section 1 for a description of the pilot burst signal. The chroma signal with the pilot bursts inserted is input to Pin 22 of the recording/playback chroma processing IC127. The chroma signal passes through the REC/PB switch inside IC127 and is input to the main converter. (The built-in ACC of IC127 does not function, acting simply as a buffer.) Balanced modulation is performed in the main converter using the 4.43 MHz input C-signal and the 5.06 MHz signal (4.43 MHz + 40 fH ≒ 5.06 MHz) created by the sub-converter, and the signal is low-band converted to the recording C-signal 40 fH (626.953 kHz). The low-band converted C-signal output from the main converter is input to the 1.5 MHz L.P.F. from Pin 16 of IC127. The 1.5 MHz L.P.F. eliminates the unwanted spurious components due to balanced modulation by low conversion system. This filter allows only the 627 kHz low-band converted C-signal to pass. The signal is then amplified to the recording C-signal by the chroma amplifier (Q1375 to Q1378). This is output to the recording amplifier on the VP-1 board through Pin 12 of CN126.

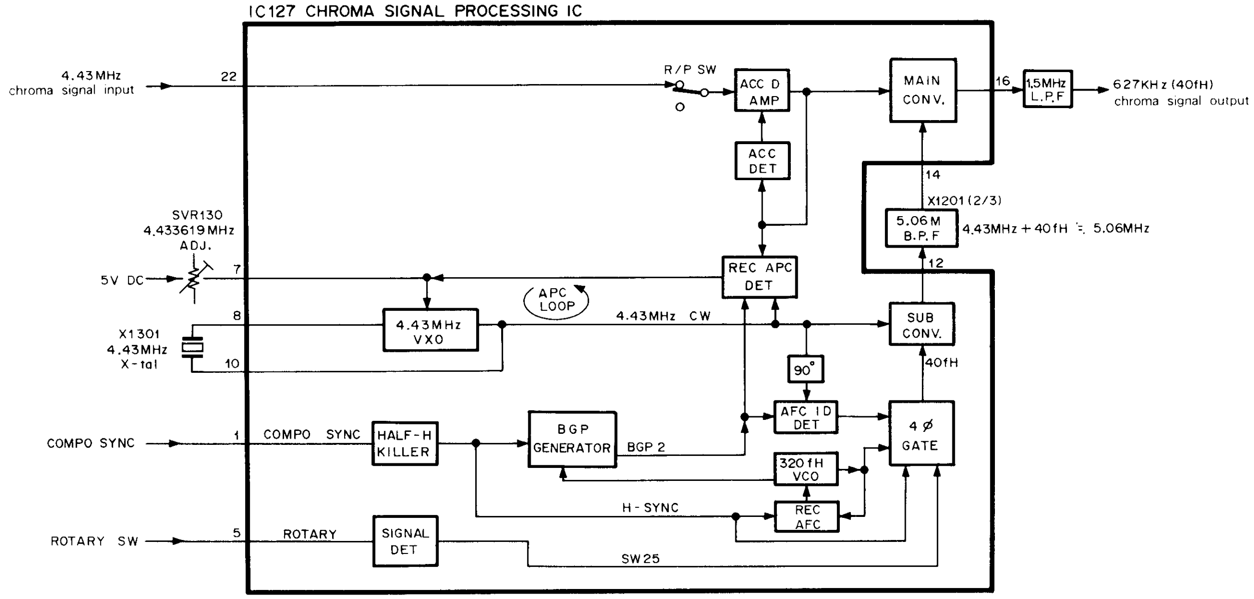

IC127 CHROMA SIGNAL PROCESSING IC
4.43MHz chroma signal input
22
R/P SW
ACC D AMP
MAIN CONV.
16
1.5MHz L.P.F
627KHz (40fH) chroma signal output
ACC DET
14
X1201 (2/3)
5.06M B.P.F
4.43MHz + 40fH ≒ 5.06MHz
12
SVR130 4.433619MHz ADJ.
5V DC
7
REC APC DET
APC LOOP
8
X1301 4.43MHz X-tal
10
4.43MHz VXO
4.43MHz CW
SUB CONV.
90°
40fH
COMPO SYNC
1
COMPO SYNC
HALF-H KILLER
BGP GENERATOR
BGP 2
AFC ID DET
4 ø GATE
320 fH VCO
H-SYNC
REC AFC
ROTARY SW
5
ROTARY
SIGNAL DET
SW25

Fig. 2-22. IC127 Internal Recording Processing System Block Diagram

[Chroma Signal Frequency Low-Band Conversion during Recording]

Generation of the conversion carrier (5.06 MHz) for chroma signal frequency conversion during recording will be described based on the recording chroma processing block diagram shown in Fig. 2-22.

The 5.06 MHz carrier (4.43 MHz + 40 fH ≒ 5.06 MHz) for conversion is obtained by balanced modulation by the sub-converter of the VXO 4.43 MHz signal and the 40 fH (626.95 kHz) signal created by the 4 ϕ gate, and is output as the sum signal (4.43 MHz + 40 fH ≒ 5.06 MHz).

4.43 MHz VXO and REC APC DET

The phase difference between the phase of the 4.43 MHz various crystal oscillator (VXO) and the burst signal phase of the input chroma signal is detected by the APC DET circuit, and the oscillation frequency phase of the 4.43 MHz VXO is controlled by this phase error voltage. This causes a 4.43 MHz signal with the same phase as the input chroma signal to be output to the sub-converter.

320 fH VCO and REC AFC

An AFC loop locking the 320 fH frequency to the H-SYNC is formed. Actually, a 40 fH (627 kHz) signal obtained by dividing 320 fH by eight is output to the 4 ϕ gate.

4 ϕ Gate

In VHS system video units, the PS (phase shift) recording method shown in Fig. 2-23 is used to eliminate crosstalk with adjacent tracks (CH1 - CH2) of the low-band converted chroma signal. This cannot be effected by the azimuth recording method.

The 4 ϕ gate use a rotary switch (25 Hz) and H-SYNC signal to output a 40 fH signal with the CH-2 track phase shift (PS), as shown in Fig. 2-23. and below, added, to the sub-converter.

- CH-1 track : constant
- CH-2 track : 90° phase delay every 1H

Half-H Killer

The operation performed by the 1/2H killer circuit is to replace the vertical blanking period equivalent pulse and vertical sync signal period with the horizontal sync signal. This creates a continuous H - SYNC signal and provides stable colour synchronization.

B.G.P. Generator

The burst gate pulse (B.G.P.) generator creates a pulse for burst signal extraction approx. 3.4 µs after the H-SYNC signal. The B.G.P. is output to ACC detection and APC detection, etc., and is used for detection of the colour burst signal.

5.06 MHz B.P.F.

This B.P.F. outputs only the 5.06 MHz signal to the main converter. This is the carrier frequency for low-band conversion and the sum components of the sub-converter output.

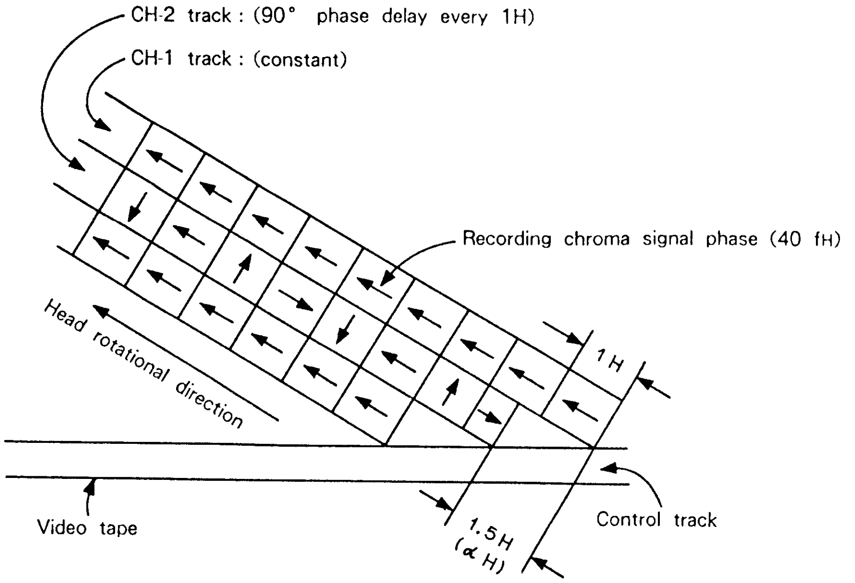

CH-2 track : (90° phase delay every 1H)
CH-1 track : (constant)
Recording chroma signal phase (40 fH)
Head rotational direction
1H
Video tape
Control track
1.5H
(α H)

Fig. 2-23. PS Method Recording Pattern

(2) Playback System (Fig. 2-21. and Fig. 2-24.)

After the playback 627 kHz chroma signal is amplified by the playback amplifier on the VP-1 board, it passes through the CN126 Pin 4 connector on the VD-1 board and is input to the chroma amplifier formed by Q1390 and Q1391. After amplification of the chroma signal, is passes through the X1201 1.5 MHz L.P.F. and is input to Pin 24 of IC127. Within IC127, it is input to the main converter via the REC/PB switch. The main converter is the same used for recording.

During playback, main converter performs balanced modulation of the 627 kHz (40 fH) playback chroma signal and 5.06 MHz (4.43 MHz + 40 fH ≒ 5.06 MHz) signal from the sub-converter, and converts the signal to the 4.43 MHz chroma signal by extraction of the difference signal. In other words, the original 4.43 MHz chroma signal which is difference signal component is extracted from the balanced modulation signal output from Pin 20 of IC127 by the X1201 4.43 MHz B.P.F. The 4.43 MHz chroma signal passes through the amplifier formed by Q1342 and Q1343, is input to the DL123 comb type filter, and crosstalk is eliminated from the recording/playback adjacent tracks. The signal is then input to the chroma ACC amplifier at Pin 1 of IC123 through the chroma amplifier formed between Pin 28 and Pin 30 of IC127 and the IC121 REC/PB switch. After the playback chroma signal is converted to the 4.43 MHz chroma signal by the IC127 main converter, the chroma level is made constant. It is then input to the pilot burst cleaning circuit of IC121 through the Q1251 buffer amp. The pilot burst signal inserted during recording is still contained in the chroma signal up until Pin 3 of IC121. The pilot burst is eliminated in IC121 by the pilot burst gate input to Pin 4. In order to eliminate DC level differences after pilot burst elimination, there is DC level difference adjustment by VR121.

The chroma signal with the pilot burst signal eliminated is input to the chroma noise reduction (CNR) circuit around IC147 after passing through the VR191 playback chroma level adjustment control. In the CNR circuit, noise reduction using the 2H correlation of the PAL chroma signal is performed by IC147 for CNR and the 2H delay line DL148. The chroma signal which passed through the CNR circuit passes through the X1405 220 nsec delay line. The signal passes through X1402 for Y/C phase adjustment as the Y-signal correlated to the P.B. chroma signal passes through the X1402 (300 nsec) delay line. The chroma signal is delayed by 300 nsec by X1402 to match the phase correction in the next stage (Q1904 to Q1906), making the Y/C phase the same.

The phase corrected chroma signal passes through IC146 for chroma signal output selection, and is output by the Y/C mix signal or chroma signal by itself, in the same manner as the EE system.

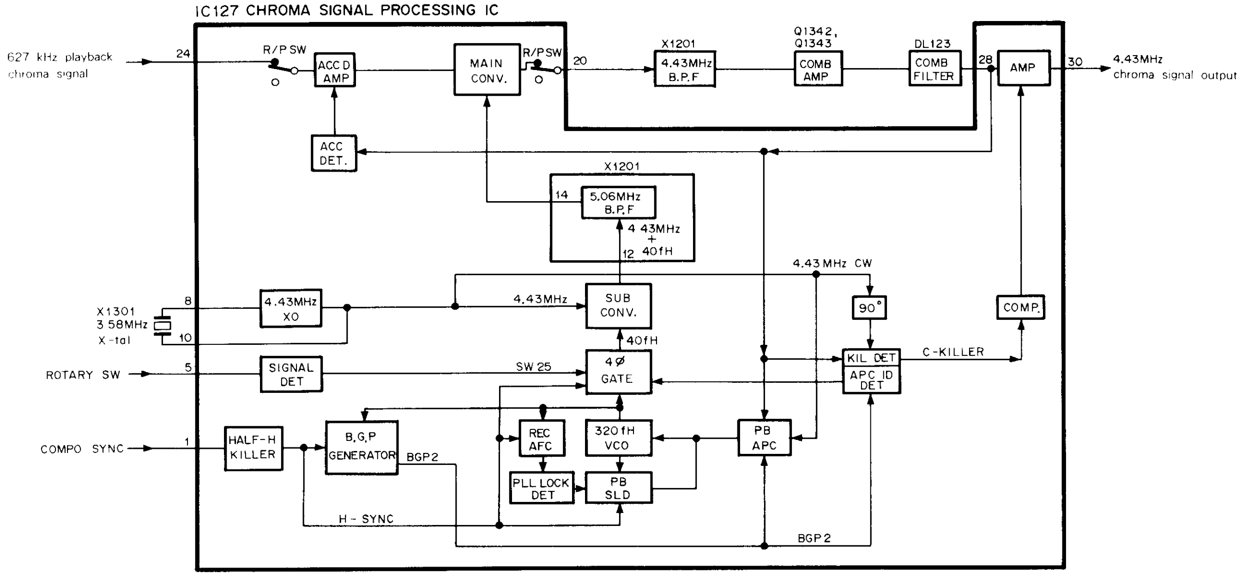

IC127 CHROMA SIGNAL PROCESSING IC
627 kHz playback chroma signal
24
R/P SW
ACC D AMP
MAIN CONV.
R/P SW
20
X1201
4.43MHz B.P.F
Q1342, Q1343
COMB AMP
DL123
COMB FILTER
28
AMP
30
4.43MHz chroma signal output
ACC DET.
X1201
14
5.06MHz B.P.F
4 43MHz + 40fH
12
4.43 MHz CW
X1301 3 58MHz X-tal
8
10
4.43MHz XO
4.43MHz
SUB CONV.
90°
COMP.
40fH
ROTARY SW
5
SIGNAL DET
SW 25
4Ø GATE
KIL DET
APC ID DET
C-KILLER
COMPO SYNC
1
HALF-H KILLER
B.G.P GENERATOR
BGP2
REC AFC
320fH VCO
PB APC
PLL LOCK DET
PB SLD
H - SYNC
BGP2

Fig. 2-24 IC127 Internal Playback Processing System Block Diagram

[Operation of Comb Type Filter (DL123)]

Fig. 2-25. shows the internal circuitry and operation of the comb type filter. During recording, the CH-2 track that phase is shifted is phase restored by the 4 ϕ gate during playback. The phase restored C-signal ⓑ is added to the 2H delayed signal ⓒ, and the crosstalk is eliminated from adjacent tracks. The C-signal with crosstalk eliminated passes through the amplifier with built-in colour killer switch and is output from Pin 30 of IC127.

[Chroma Signal Frequency Conversion for Playback]

The chroma signal frequency conversion for playback uses the 5.06 MHz conversion carrier signal, in the same manner as recording.
The 5.06 MHz (4.43 MHz + 40 f_H ≒ 5.06 MHz) carrier for conversion is obtained by balanced modulation of the 4.43 MHz crystal oscillator XO provided by the sub-converter (SUB CONV.) and the 40 f_H (627 kHz) signal output by the 4 ϕ gate, and the sum signal (4.43 MHz + 40 f_H ≒ 5.06 MHz) is output.

4.43 MHz XO

The 4.433619 MHz fixed crystal oscillator (XO) is used during playback. The oscillation frequency of the XO forms the reference (frequency/phase) signal for the 4.43 MHz restored chroma signal.

320 f_H VCO and PB APC

The 320 f_H VCO frequency is created by synchronization to the H-SYNC. During playback, the phase difference between the 4.43 MHz XO phase and 4.43 MHz restored chroma signal is detected in the PB APC circuit, and the phase of the 320 f_H signal is controlled by this error voltage. This eliminates phase fluctuations in the chroma signal occurring during playback and restores a stable chroma signal.

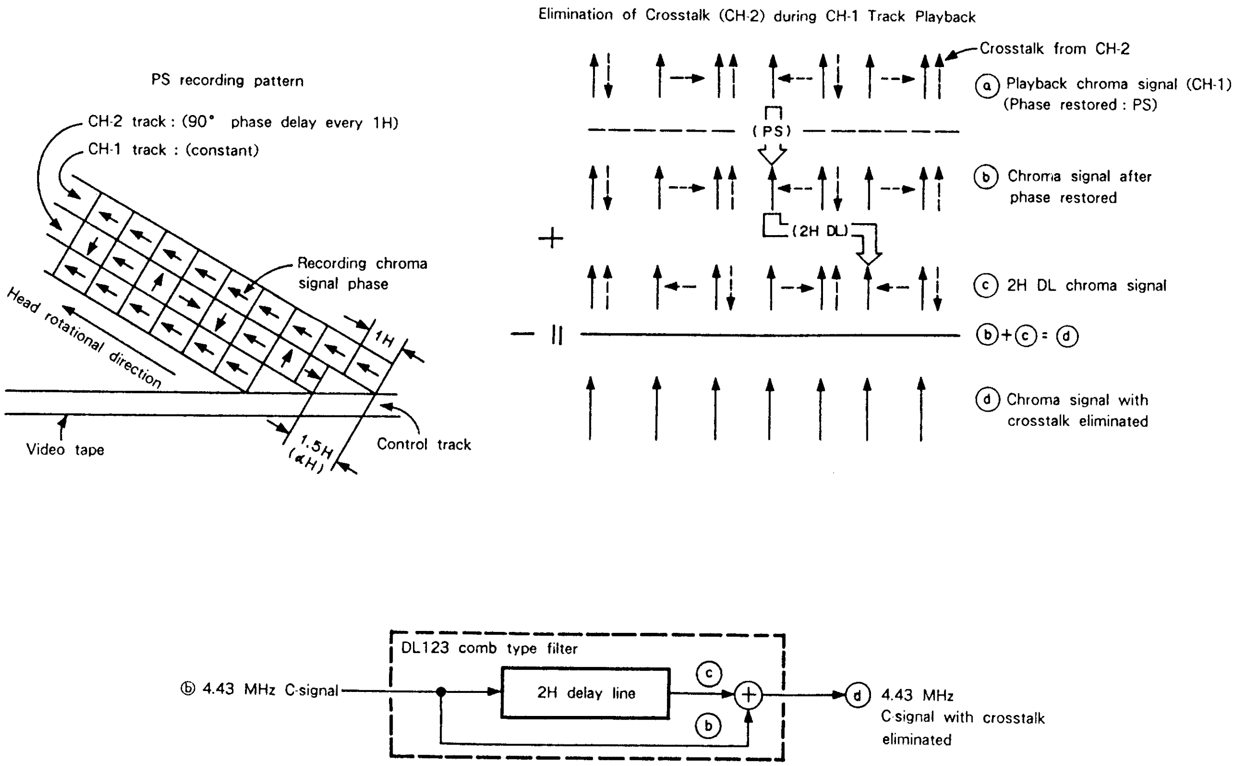

PS recording pattern
CH-2 track : (90° phase delay every 1H)
CH-1 track : (constant)
Recording chroma signal phase
Head rotational direction
1H
1.5H (αH)
Video tape
Control track
Elimination of Crosstalk (CH-2) during CH-1 Track Playback
Crosstalk from CH-2
ⓐ Playback chroma signal (CH-1) (Phase restored : PS)
(PS)
ⓑ Chroma signal after phase restored
(2H DL)
+
ⓒ 2H DL chroma signal
− ||
ⓑ+ⓒ=ⓓ
ⓓ Chroma signal with crosstalk eliminated
DL123 comb type filter
ⓑ 4.43 MHz C-signal
2H delay line
ⓒ
ⓑ
ⓓ 4.43 MHz C-signal with crosstalk eliminated

Fig. 2-25. Comb Type Filter Operation

3. S-VHS/VHS Discrimination Circuit (Fig. 3-1.)

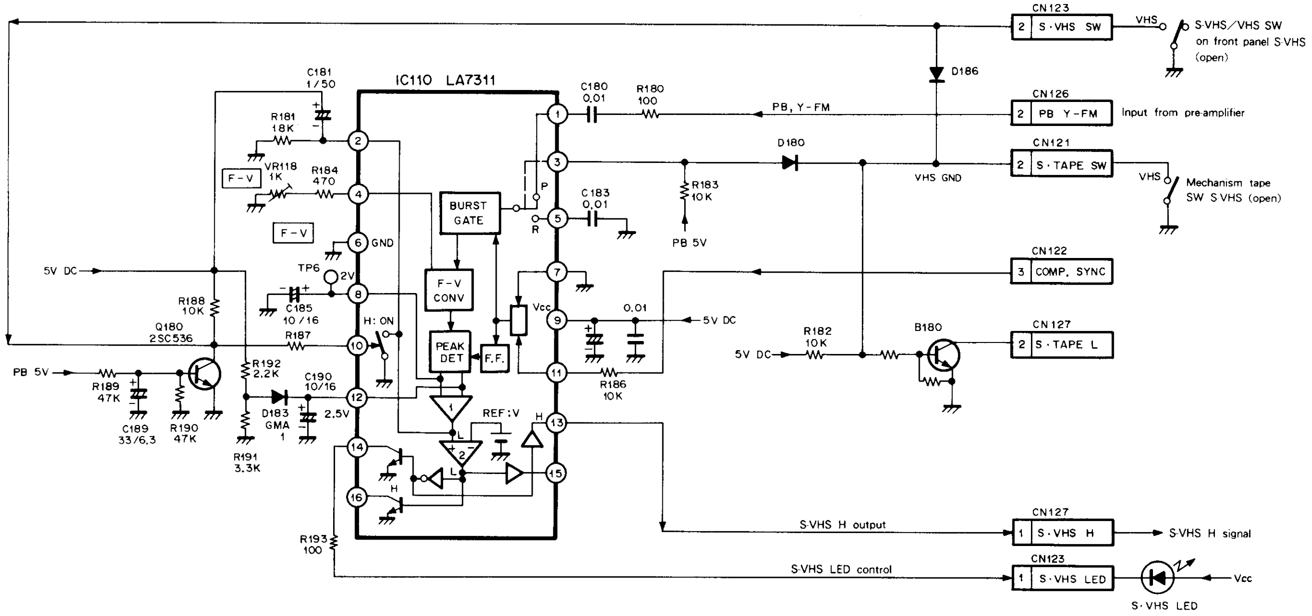
3-1. OUTLINE

Although S-VHS video tape is high-performance with high magnetism resistance developed for high-band recording (S-VHS), it can also be used for recording and playback by the conventional VHS system video units. Thus, this S-VHS tape will contain a mixture of S-VHS system signals and VHS system signals. This units includes an automatic discrimination circuit for determination of the recording system during playback, preventing compatibility problems between S-VHS and VHS.

The luminance signal (Y) FM modulation frequencies vary between the S-VHS system and VHS system in the following manner.
S-VHS FM modulation sync tip frequency : 5.4 MHz (5.4 to 7 MHz)
VHS FM modulation sync tip frequency : 3.8 MHz (3.8 to 4.8 MHz)
This circuit automatically determines the above Y-FM sync tip frequency difference during playback from the IC110 internal frequency by the voltage (F-V) conversion circuit, and outputs the circuit select signal (S-VHS H) and S-VHS indication LED control signal ($\overline{\text{S-VHS LED}}$).

3-2. CIRCUIT DESCRIPTION

[Discrimination Operation During Playback]
During playback of an S-VHS tape, the playback Y-FM signal input to Pin 1 is input to the burst gate circuit by the Pin 3 switch control signal (H level). In the burst gate circuit, the Y-FM signal is output to the F-V conversion circuit during the horizontal sync period every 1H by the COMP. SYNC input to Pin 11. In other words, the sync tip period frequency signal is input to the F-V conversion circuit. The F-V conversion circuit is regulated by VR118 at Pin 4 so that the Pin 8 PEAK DET circuit output is 2V (DC) when there is VHS system (3.8 MHz) signal playback. In the PEAK DET circuit, the F-V conversion peak hold voltage is output to both inputs of op amplifier 1 at 1H intervals alternately by the F-F (flip flop) circuit switched by COMP SYNC (Pin 11). A bias voltage of 2.5V is applied to the Pin 12 input of op amplifier 1 by R192, R191, and D183. During VHS system (3.8 MHz) signal playback, the level at the Pin 8 input of the op amplifier 1 is 2V, and the op amplifier 1 output will be high voltage as the bias voltage (2.5V) at Pin 12 will be high. On the other hand, during S-VHS system (5.4 MHz) signal playback, voltage of approximately 3V will be output as the F-V converter will be proportional to the frequency. Thus, the bias input at Pin 12 and input voltage (3V) of op amplifier 1 Pin 8 will be the same, and the output will be low voltage.



C181
1/50
IC110 LA7311
R181
18K
VR118
1K
R184
470
F-V
F-V
GND
5V DC
TP6
2V
R188
10K
C185
10/16
Q180
2SC536
R187
H: ON
PB 5V
R189
47K
R192
2.2K
C190
10/16
D183
GMA
1
2.5V
C189
33/6.3
R190
47K
R191
3.3K
R193
100
BURST GATE
F-V CONV
PEAK DET
F.F.
P
R
Vcc
REF:V
H
L
L
H
1
2
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
C180
0.01
R180
100
C183
0.01
0.01
R186
10K
PB, Y-FM
D180
R183
10K
PB 5V
5V DC
5V DC
R182
10K
B180
D186
VHS GND
CN123
2 S·VHS SW
VHS
S-VHS/VHS SW
on front panel S-VHS
(open)
CN126
2 PB Y-FM
Input from pre-amplifier
CN121
2 S·TAPE SW
VHS
Mechanism tape
SW S-VHS (open)
CN122
3 COMP. SYNC
CN127
2 S·TAPE L
S-VHS H output
CN127
1 S·VHS H
S-VHS H signal
S-VHS LED control
CN123
1 S·VHS LED
Vcc
S·VHS LED

Fig. 3-1 VD-1 Board S-VHS/VHS Discrimination Circuit

- Op amplifier 1 output (Pin 2)
  VHS : High (5V)
  S-VHS : Low (0V)

The op amplifier 1 output voltage shown above is input to the + side of op amplifier 2. The REF voltage is applied to the - side of op amplifier 2. In op amplifier 2, the output has the same configuration as above op amplifier 1, the following output results by passing through the internal inversion circuit, etc.

- S-VHS H signal : Pin 13
  S-VHS : High (5V)
  VHS : Low (0V)
- S-VHS LED signal : Pin 14
  S-VHS : Low
  VHS : Open

During Playback

Mechanism SW / Front SW		Mechanism tape switch	
		S-VHS tape (H)	VHS tape (L)
Front S-VHS switch	S・VHS (H)	Discrimination operation	—— (VHS fixed)
	VHS (L)	Discrimination operation	—— (VHS fixed)

[Operation During Recording]
When both the tape switch and front panel S-VHS switch are both set to the S-VHS position during recording, the internal switch control voltage at Pin 10 is at the high voltage and the op amplifier 1 output (Pin 2) is set to the low voltage by the internal switch. Thus, the Pin 13 and Pin 14 outputs are set to S-VHS in the same manner as playback. On the other hand, if either the tape switch or front panel switch is set to the VHS position, the output will be high voltage as the op amplifier 1 input will be the Pin 12 bias (2.5V) and the Pin 8 input will be the low voltage (no signal input state). The output from Pin 13 and Pin 14 will be VHS, in the same manner as for playback.

During Recording (determination not possible)

Mechanism SW / Front SW		Mechanism tape switch	
		S-VHS tape (H)	VHS tape (L)
Front S-VHS switch	S・VHS (H)	S・VHS	VHS
	VHS (L)	VHS	VHS